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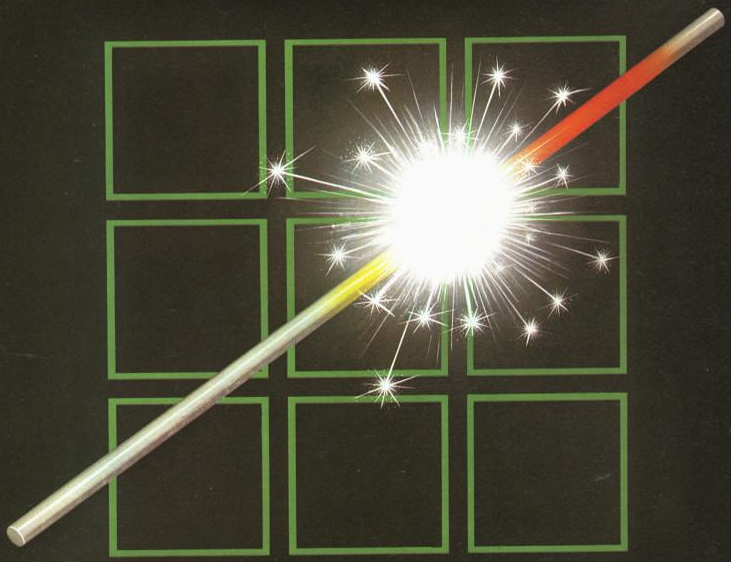

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Editorial

THE RECENT management changes at Commodore UK, coupled with the lack of confidence displayed by retailers, has led to a general air of uncertainty. The departure of Howard Stanworth was explained by the claim that having put the Corby plant into production, his aims had been achieved. However, the current pricing problems with the 64, which stem from the cuts in the Plus/4's price, must have accelerated his departure. The loss of marketing manager David Gerrard was understandable in the resulting situation.

Now Nick Bessey, formerly of IBM, must take up the mantle of UK general manager, and deal with a dispirited dealer chain and a disappointed public. Great faith is being placed in the business machines, though most of you will be more interested in the C128 and the enigmatic Amiga machine. It remains to be seen whether Bessey, and whoever assumes the duties of marketing manager, can restore the position of Commodore in the home computer market as the shadow of Jack Tramiel's Atari looms ever larger.

Next Month

Magic Mouse
SMC's artistic beastie put through its paces

Pascal, COBOL, and Forth
Looking at the alternatives to Basic

Plus
Competitions, news and reviews

EDITOR Christopher Jenkins **PRODUCTION EDITOR** Barbora Hajek **EDITORIAL SECRETARY** Geraldine Smyth **GROUP ADVERTISEMENT MANAGER** David Lake **ADVERTISEMENT MANAGER** Simon Langston **ADVERTISEMENT EXECUTIVE** Simon LaFosse **MANAGING EDITOR** Brendon Gore **PUBLISHING DIRECTOR** Duncan Scot **TELEPHONE (ALL DEPTS)** 01-437 4343 **UK ADDRESS** Commodore Horizons, 12/13 Little Newport Street, London WC2H 7PP **US ADDRESS** Commodore Horizons, c/o Business Press Int'l, 205 East 42nd Street, New York, NY 10017 **SUBSCRIPTIONS** UK £10.00 for 12 issues, overseas surface (excluding US and Canada) £16.00 for 12 issues, US and Canada airlifted US$33.95 for 12 issues.

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ABC

SUBMITTING ARTICLES *Commodore Horizons* invites readers' contributions, either program listings or articles. Articles should be typed, double spaced with a wide margin. When possible programs should be submitted on cassette or disk with a printout on plain white paper. Please keep a copy of your submission — do not send your only copy. Please enclose an s.a.e. if you wish your submission to be returned. All submissions must be your own original work.

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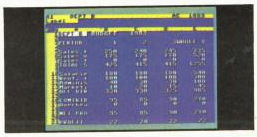
HANDIC DATABASE
Database, for example, is a brand new, cartridge and disc based software package. Especially designed for both, first time and experienced data base users.

For those of you who need to collate and store information for easy recall, data base can make life easier. The basic package includes a mailing list and 4 different print programs.

CALC RESULT
Calc Result, the financial spreadsheet for the 64, that's ideal for all those domestic headaches, such as loans, mortgages, home budgeting, stock portfolios, tax planning – let alone all those bills! In the office too Calc Result will make calculating, budgeting, simulation, construction so much easier for the business – large or small. This easy to learn package comes in two versions – Calc Result easy (cartridge based) and Advanced (disc and catridge based with pedagogical manual).



TECHNICAL DATA
- **Spread sheet size** 64 X 254 X 32 pages
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- **Printing:** Flexible printing formats out to most popular printers
- **Graph:** Histogram with scroll through feature rows and columns for printing
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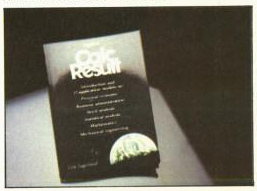
The user of Calc Result will find among the applications given many useful examples of how to get the most from Calc Result.



THE Handic supermarket basket is full of 'goodies' for your Commodore 64. Here is a brief description of what they all are! Don't forget – if you need any more information, either clip the coupon (and tick column 'A') or give us a ring.

1 Mon 64
An outstanding Machine Code Monitor (cartridge based)

2 Teledata
Communication cartridge for use with the CBM 64, link up with Databases like the bank or supermarket, over the telephone lines.

3 Superbox 64
An expansion unit for the Commodore, which features three independant cartridge slots; IEEE interface that is totally transparent; has multi-user capabilities with IEEE; and a re-set switch which activates a cold start on the computer. This unit will connect up to 3 cartridges at the same time, which makes frequent altering between programs simple and reduces wear on the cartridge slot.

4 Vic Rel
Vic Rel (Rel 64) is a relay cartridge for the CBM 64 and Vic 20 which has almost limitless applications, such as control of burglar alarms, garage doors, door locks, electric radiators, lamps , transmitters, model railways, etc.etc.

5 Disc-based games
Handic have a set of disc based games for the Commodore 64, all are great fun and superb colour graphics. At around 9.95 each. Why not treat yourself to a few?
Quantity discounts are available on request – dealer enquiries are also welcome.

6 Diary 64
An ideal program for keeping track of telphone numbers, addresses, appointments, schedules, in fact the ideal time manager for all you sieve-heads.

7 Stat 64
The statistical CBM cartridge which ads 19 new commands to your Basic language. An excellent programming aid for all you statisticians.

8 Graf 64
A CBM cartridge that turns solutions of equations into graphical analysis, what you might call a plotter-jotter.

9 Handic Auto Modem
This modem is the expanded version of the Videotex modem (see illustration). When used together with the Handic Teledata Base 64 this unit enables you to set up your own data base with information.

Videotex Split-Speed Modem
This Split-Speed modem is especially designed to connect with computers over the telephone lines, its facilities include auto-dialling, line control, etc. (BT approval applied for).

10 RS232
A standard V.24 (RS232) interface for connecting the CBM 64 to printers and other peripherals.

11 Bridge 64
A cartridge bridge game for the intelligentsia.

12 Forth 64
A Forth generation programming language for people who know what they are talking about, and want to know even more.

Checklist

COMMODORE 64–SOFTWARE		A	B
CALC RESULT ADVANCED	99.00		
CALC RESULT EASY	49.95		
DIARY 64	19.95		
BRIDGE 64	19.95		
STAT 64	29.95		
REL 64	34.95		
MON 64	39.95		
GRAF 64	29.95		
FORTH 64	34.95		
SSP (DISK BASED DIARY)	12.95		
DISK BASED GAMES			
SPACE ACTION	9.95		
SPACE TRAP	9.95		
OISAC	9.95		
Q-HOP	9.95		
THE SHIP	9.95		
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FOURTH SARCOPHAGUS	9.95		
STELLAR CONFLICT	12.95		
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REAL ESTATE	12.95		
COMMODORE 64–HARDWARE			
VIC SWITCH	97.75		
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6M CABLE	7.94		
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RESET SWITCH	5.98		
APPLIED CALC RESULT	14.95		
NEW HANDIC DATA BASE	62.00		
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CALC RESULT	316.25		
WORD RESULT	316.25		
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PET SWTICH MOTHER UNIT	172.50		
DAUGHTER UNITS			
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Send your letters on software, hardware, computing or life in general to Mail Merge, Commodore Horizons, 12/13 Little Newport St., London WC2H 7PP.

Netted again

THANK YOU for the thorough and largely accurate review of COMPUNET in the January issue of Commodore Horizons. I would like to correct a couple of mistaken impressions and comment on one or two of your observations. The service is not run by Commodore and they have no shareholding in COMPUNET TELESERVICES LTD. which is an independent company. Commodore market the modem, contribute to a section of the database and have supplied software for sale, along with several other companies, on Compunet. They have also provided a large number of free educational products.

As for making money out of COMPUNET, it is Commodore's profit on the modem which is funding the free first year subscription. They will make money from telesoftware sales but the users too benefit from cheaper prices. None of our subscribers have commented on the 'complexity' of our prices and you are the first of the many reviewers to feel this.

The majority of users will access COMPUNET in the evenings, upload the occasional page of text or small program or buy software at a price clearly displayed on screen. They will pay what they see for software, a penny per page or 1K of program uploaded and nothing for being connected. If you can suggest a less complex tariff than this I would like to discuss it with you.

The names such as The Jungle, The Study, Software Park are a matter of taste and may not be to everyone's liking as you observed personally. However, most people seem to like them. Our aim is to de-mystify home computer communications services and to give a more magazine-like flavour.

Thanks again for the review which made all the points well — particularly the one that the Commodore modem is the only one to give you both COMPUNET *and* MICRONET.

J M Clarke
Commercial Manager
Compunet Teleservices

Desktop tips

I HAVE one of those popular home computer desks with the C2N Datasette on the desk top by the side of the computer, and the monitor on the shelf just above it. Two tape programs have recently given me considerable loading difficulties. I have now enclosed the Datasette in an earthed metal case made of thin sheet steel, with a hinged lid to make access easy. This seems to have cured my troubles by shielding the tape from the RF and magnetic fields. I intend now to screen the inside of the CBM64 case with aluminium kitchen foil stuck on with double-sided sticky tape. Hope this will be a helpful tip for some of your readers.

R Mascall
Thornbury
Bristol

STAR LETTER

VIP updated

THANK YOU for your review on VIP TERMINAL which appeared in the April 1985 issue. We are pleased to advise you that VIP TERMINAL now includes a 1200/75 baud option, thereby resolving most of the problems that John Cochrane found in this review.

G J Barnett
Managing Director
Impex Software

Musical notes

MANY commercially produced games programs contain recognisable musical themes. This facility is something I'm trying to develop in my own software, but I'm not sure where I stand as regards copyright. Could you please advise.

Ian Coxon
North Shields

IT'S A problem almost as knotty as that of software piracy. Many companies use music without authorisation, and Mastertronic was recently forced to discontinue using the music from Michael Jackson's *Thriller* on their game Chiller. To be strictly honest you should enquire with the British Phonographic Industry, 273 Regent St, London W1, 01-629 8642, if you wish to purchase rights to use previously released music in a commercial product.

Print and plot

I AM trying to start a user group for the CBM 1520 printer / plotter with the aim of exchanging programmes, hints / tips etc. I would be grateful if you could mention this on the letters / news page of your magazine.

Anyone interested should contact me by letter (SAE) or on:

Prestel Mailbox: 782279612
Compunet Courier: SCB 1

Steven Birks
86 Birches Head Road
Birches Head
Stoke-on-Trent
ST1 6LJ

COMPUTER
FINK
BLARE BLARE!
FINK PICKS AN INNOCENT LITTLE VIC-20 FROM A SHELF IN DIXONS...
LOADING
WORP
FINISHED.. AT LAST! MY FABULOSO NEW 3-D GAME..... CRYPTO! NOW TO TEST IT OUT ON AN INNOCENT COMMODORE UP THE ROAD...
N. Murray
CRYPTO
WHOOPS! I THINK I OVERDID IT!
BLARE BLARE BLARE

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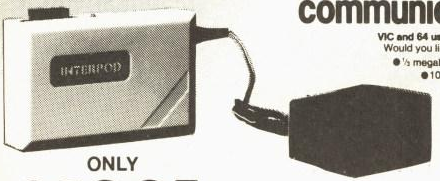
- Fits comfortably in your hand for long play periods.
- Comes complete with receiver/interface unit which simply plugs into the rear of your Commodore.

Simply incredible at **£29.95**

INTERPOD

Now the VIC 20 and 64 can communicate with PET peripherals



VIC and 64 users

Would you like to be able to access **any** of these peripherals from your computer?

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Cheetah Marketing

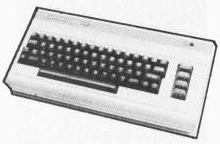
Cheetah Marketing Ltd (Dept CH),
24 Ray Street, London EC1R 3DJ.
Tel: 01-833 4909. Telex: 8954958.

64 under threat?

THE FUTURE of the 64 looks uncertain following the threat by major retailers Laskys and Boots to discontinue selling the machine.

Boots' Assistant Merchandise Controller Peter Frost blamed Commodore's price-cutting on the Plus/4 for the current problem. "When Commodore cut the Plus/4 to £150, we told them that it would add confusion to an already confused marketplace. Effectively Commodore's price structure is geared to the old situation".

Boots has now dropped the C16, and will not replace



existing stocks of the 64 unless profit margins can be restored. Boots' current price for the 64 is £149, while Laskys' price is £129.

Laskys' computer buyer Philip Holton commented "We are clearing out our demo models, and will not be stocking the 64 any more because the cost price is more than it is being sold for in the marketplace".

Neither Laskys' nor Boots' intend to order the C128 until existing computer stocks have been cleared.

A Commodore spokesman said "Commodore is naturally concerned about the environment in which the trade is operating. We are actively looking at ways to alleviate the retailers' problems and over the coming weeks will be discussing with our customers the best way to do this."

Gerrard goes

DAVID Gerrard, appointed as CBM UK's marketing manager shortly after Christmas, has now left the company.

Commodore's David Gerrard; moves to STC

Gerrard, formerly with telecommunications giant Plessey, is believed to have clashed with financial controller Arthur Scot after the departure of Howard Stanworth. Gerrard, who was appointed by Stanworth, accepted an offer from STC Telecommunications in early April.

Gerrard is now working as international marketing manager for STC in America. As yet, Commodore has made no indication what plans have been made to replace him.

US Gold's long walk

CHARITY begins at home, they say, and US Gold's contribution to the Soft Aid compilation tape isn't the end of the story.

Twenty of the company's employees are taking part in a 26-mile marathon fund raising walk in Birmingham in conjunction with independent local radio station BRMB. US Gold's Louise Jones said that the fund-raising event, which would raise money for Mencap, Save the Children and other charities, was expected to be a big success.

"We'll be aiming to raise as much money as possible for these charities by getting people to sponsor our walkers."

"Remember it's all in a good cause!"

If you'd like to sponsor a walker on the event on May 5th, contact Louise Jones at US Gold, Unit 10, Parkway Industrial Centre, Heneage Street, Birmingham, B7 4LY, 021-359 3020.

Fifo goes RS-232

IF YOU'RE having problems with RS-232 interfacing, a new product from Fifo Computers might solve your problem.

The Fifo RS-232 interface plugs into the user port at the back of the 64, SX-64 or Vic 20. Using the Commodore RS-232 kernal firmware, it allows you to connect your micro to either a suitable printer or to a modem.

The interface has a 25-way D connector which can be male or female. The Fifo interface comes with a 1-year guarantee and costs £24.95. Contact Fifo on 01-590 0833.

Centronics utility mushrooms

MUSHROOM SOFTWARE'S centronics printer interface utility package is now available.

Centipede offers the ability to print the whole Commodore character set plus control codes, and both hi- and low-res screen dumps, including screens generated with Koala Pad or Doodle. Partial screen dumps down to 8x8 pixels can also be achieved.

The interface software can be located almost anywhere in memory, and an auto-relocator allows it to avoid existing programs. Control codes can be translated into English abbreviations, and spaces can be counted.

Centipede's other facilities include assignable function keys, built-in buffer and compatibility with Mushroom's Extended Basic package, which adds 51 commands to 64 Basic.

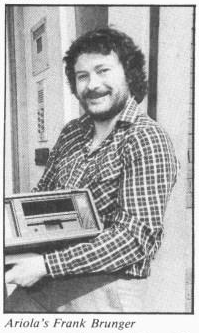
Centipede costs £11.50 on disk, £9.50 on tape, and Mushroom can also supply suitable connection cables. Contact the company through Keyplan Computers, 193 Rommany Rd, London SE27, 01-670 3533, for more details of Centipede and special prices on Centronics printers.

Ariola gets RamJam

ARIOLASOFT has agreed to market software from RamJam.

Three Days In Carpathia, RamJam's follow-up to the successful Valkyrie 17, was to have been distributed by Palace. Matthew Tims, Palace sales manager commented "We had great fun working with RamJam on Valkyrie 17, but they weren't under any obligation to place their next game with us. They know that we have our own games to work on — Cauldron has just come out and we're now working on the next batch of ideas — and it's clear that Ariola has a bigger international base than Palace."

Ariolasoft's future plans include marketing more software licensed from American software labels such as Electronic Arts, Broderbund and Batteries Included. These will include utility programs such as the popular PaperClip word processor package.



Ariola's Frank Brunger

Meanwhile Ariolasoft's promotional exercises go on: they've just given away a Commodore SX-64 as part of a monthly draw contest for purchasers of their games. The hit Lode Runner, which contains a screen customising option, will be the subject of a competition with 10 £100 mini-Krugerrands as prizes.

For more details, contact Ariolasoft at Ashphalte House, Palace Street, London SW1.

Commodore's GM

COMMODORE UK has a new General Manager. Nick Bessey, 36, has replaced Howard Stanworth, who left the company in February.

Bessey was formerly the key strategist behind IBM's retail marketing division. In his twelve years with IBM, Bessey served as a salesman, and rapidly progressed after some notable successes to marketing management positions. After two years in New York as marketing planning manager for Canada, Japan and Australia, he returned to the UK as IBM operations manager.

Bessey's latest post at IBM was as head of the team dealing with marketing of low-cost products such as the IBM PC. In view of Commodore's recent launch of a PC-compatible machine, Bessey's appointment seems to confirm that Commodore's plans for the future rely heavily on increased penetration of the business market.

CBM International shares down again

COMMODORE International's shares have hit an all-time low on the US market.

Hit by the company's 94% drop in earnings in the quarter ending December 31, Commodore's share prices have also been affected by rumours, denied by Commodore, that the company has promised an extra $7m to the newly acquired Amiga unit.

Sales of the 64 have been poor since Christmas, and with the relative failure of the Plus/4 and C16 in the US market, large stocks of hardware are failing to shift from the warehouses. Market analysts are predicting a poor year overall for Commodore International, with slightly better results predicted for 1986.

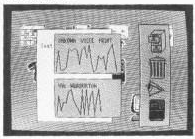
The C128 is seen as a last attempt to make money from a shrinking market for cheap home computers, while pundits place more faith in the future of the Amiga machine. In the UK market the order of the importance of the machines will probably be reversed.

The Forsyth Protocol

THE FOURTH Protocol, Frederick Forsyth's best-selling thriller, is to be released as a computer game.

The CBM 64 version is published by Hutchinson Computer Publication in May. The game is an interactive adventure in which the cold war hots up. The gamer plays an MI5 agent whose job is to prevent the detonation of a nuclear warhead somewhere in England.

The game operates through icons, windows and multiple-choice questions. There are three phases — the first sees you operating a computer in your London office to try to obtain clues, the second deals with tracking down the nuclear device and the third represents the SAS assault on the KGB's secret base.



The Fourth Protocol will cost £12.95 on cassette and £15.95 on disk. For more information contact HCP, 17-21 Conway St, London W1, 01-387 2811.

COMMODORE HORIZONS will be hosting its own Commodore computing show in London this October.

The show, at the Hammersmith Novotel, will take place on Saturday 26th and Sunday 27th of October, and will cater for users of the 64, C16, Plus/4, 128, Vic 20 and business machines.

The show will feature exhibitions from all the major Commodore software houses, hardware manufacturers and dealers, plus competitions and an advice centre.

There'll be special sections for business and educational software, and lots more to see and do. We'll give you more details nearer the time, but exhibitors can contact Tim Collins of Computer Marketplace Exhibitions Ltd for more details on 01-930 1612.

Look out for more details of the Commodore Horizons Show in future issues of the magazine.

Ultimate Entombed

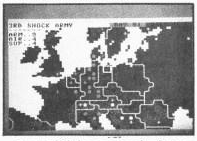
ULTIMATE'S follow-up to The Staff of Karnath will be Entombed. The 64 game is another 3-dimensional graphic arcade adventure, featuring the hero Arthur Pendragon.

Entombed will cost £9.95, and should be available by the time you read this. For more details contact Ultimate at The Green, Ashby de la Zouch, Leicestershire, LE6 5JU.

PSS's two tribes

PSS'S WAR simulation Theatre Europe claims to be an accurate representation of the aftermath of a breakdown in the Geneva Arms Talks.

Based on accurate information from NATO and the Ministry of Defence, programmer Alan Steele's game begins with a crossing of the West German border by Soviet tanks. The game, like PSS's earlier Battle of Midway, contains menus, tables, map displays and arcade sequences of aerial and tank attacks. As commander of the allied military forces your task is to outwit the opposition by skilful deployment of your resources. There are three play levels; conventional, limited nuclear, and all-out.

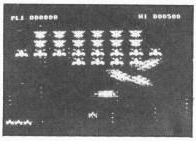


Lest PSS be accused of warmongering, the game includes music by Lennon and McCartney — Give Peace a Chance. Contact PSS at 452 Stoney Stanton Road, Coventry, 0203-667556.

Galactic

There aren't many variations possible on the age-old theme of Galaxions, but when it's done well it can still be a very exciting game. Solar's version for the C16 is a conversion of a program for earlier machines, but stands up fairly well.

Compared to the similar Xargon Wars from Gremlin, Galaxions is perhaps inferior graphically but superior sonically. As usual, the baddies stream in from the sides of the



screen, whirling and diving, then form a pattern at the top. Your gunship moves left and right at the bottom, and all you have to do is zap the baddies as they dive down at you. The animation is a bit flickery, but to make up for it the sound effects are very good — it just goes to show what can be done with a little imagination, even when you're limited by the C16's sound chip.

You have the traditional three lives, and there are lots of screens to get through. What more could you want? Well, it would be nice to have something which isn't a conversion, and ideally a totally original idea. Still, I expect most C16 owners are first-time computer users, and may well be happy to play versions of the classics for the moment. I'm looking forward, though, to seeing more originals and fewer oldies on the C16.

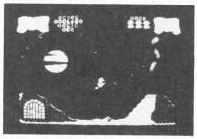
Program: Galaxions, C16
Supplier: Solar
Price: £6.95
Graphics: ★★★★★
Sonics: ★★★★★★
Gameplay: ★★★★★

Magic!

It's some time since Palace's last release, last year's successful The Evil Dead. The time taken to develop the follow-up, Cauldron, is some measure of the huge amount of effort which has been put in by what must be one of the most talented programming teams in business.

Cauldron is an arcade adventure in which you play a witch with a laudable ambition — to become Witch Queen. You must fly around the world — a beautifully-detailed scrolling background — seeking magic keys which enable you to enter secret caverns in search of the ingredients necessary to make a portion. The way is blocked by hostile bats, birds, pumpkins and ghosts, among other nasties.

Every aspect of this game shows incredible attention to detail — the chilling music, hilarious title screen, brilliant animation, ingenious plot and clever designs. Most of the run



relates to finding out what you're trying to do, so here are a few tips — don't try to mount your broomstick until you're on a safe spot, and work out early on how to replenish your magic powers or you'll soon run out of hags.

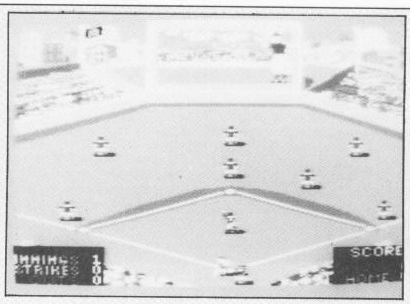
Magic — go out and buy it instantly.

Program: Cauldron, 64
Supplier: Palace Software
Price: £7.95
Graphics: ★★★★★★★★★
Sonics: ★★★★★★★★★
Gameplay: ★★★★★★★★★

Off-base

Imagine is back — in name at least — with this effort, which in the final days of the original company was taken to the States in order to try to raise some financial backing. I don't know if they had any success, but you can see the point — the game is so American that it would be more appropriate coming from US Gold.

This is a complete implementation of a nine-innings game of baseball, including one and two player options, selectable team colours, control of the batters and fielders, and all the razzmatazz associated with American sport — cheerleaders, flags



waving, patriotic music and all.

The action is represented in a perspective view of the whole field, with close-ups of the batting diamond on a giant video screen. If you're pitching, you can control and rate and height of pitch with the joystick, and if you're batting you can control the hit and the runners. The skill lies in either catching or fielding the ball and returning it to the pitcher or the appropriate base, but beyond that I have no idea what's going on. Baseball is fairly similar to rounders, but the subtleties escape me completely, and the game manual doesn't actually tell you what you're trying to do. I waited in vain for the promised demonstration to appear.

So what we're left with is a graphically interesting, generally well-presented game which is absolutely baffling. If you don't know, like me, what "steal", "slide" and "outfield" mean, all I can advise you to do is to read "Peanuts".

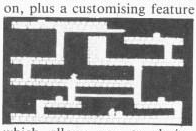
Program: World Series Baseball, 64
Supplier: Imagine
Price: £8.95
Graphics: ★★★★★★
Sonics: ★★★★★
Gameplay: ★★★★★

Running

Lode Runner is pretty long in the tooth, however, it's been a huge success in the States, and is now available through Ariolasoft.

It's the great-grandaddy of all ladders-and-platforms games, with your intrepid hero scampering up and down ladders collecting chests of gold. In pursuit are agents of the Bungeling Empire, who will clobber you given a chance. Their movements are pretty intelligent, so you'll need to trap them by digging holes with your laser gun. This will trap them and force them to drop their gold boxes, which you can them pick up if you move fast. You must beware of falling into your own pits.

There's a full range of player options including extra lives, next level, speed control and so on, plus a customising feature



which allows you to design your own screens.

Although I wouldn't normally recommend this sort of game, since it's an idea which has been very much overused, Lode Runner is surprisingly enjoyable, and I'll certainly be playing it again.

Program: Lode Runner, 64
Supplier: Ariolasoft
Price: £11.95 cass, £14.95 disk
Graphics: ★★★★★
Sonics: ★★★★★
Gameplay: ★★★★★★★

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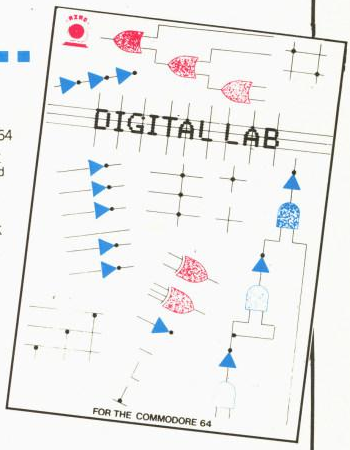

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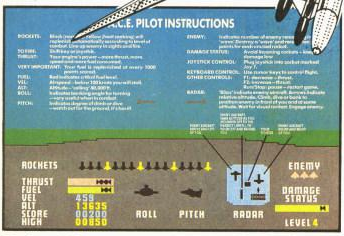

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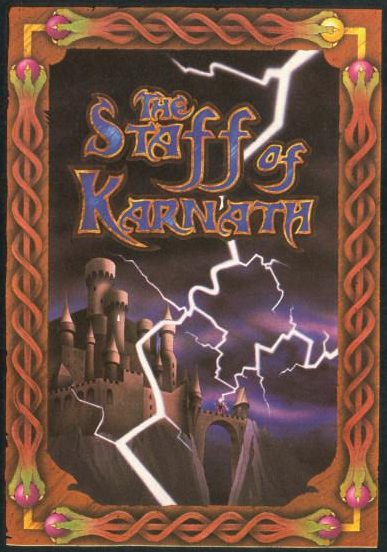

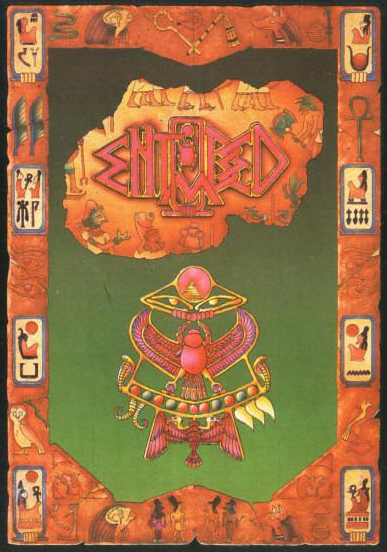

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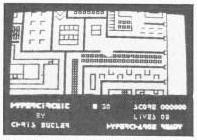
The kick inside

There have been a few attempts to set computer games inside a computer before now, but none have ended up as well as Alligata's Hypercircuit. It's not that the layout of microprocessors, data busses and resistors is particularly realistic — unless your 64 is some kind of extra-terrestrial export version, the insides won't look anything like it.

However, the graphics are very colourful, and the baddies are fast-moving and particularly nasty, including destructors, chargers, fighters, pulsers and mains spikes.

You control your patrol craft around the circuit. It flips to face in the direction you're moving, and releases powerful energy bolts along the circuit. Some of the baddies follow the lines, and will be easily zapped.



Others fly along above the circuitboard, and take much more skill to destroy.

The ultimate aim of the game is to destroy all the 30 baddies in each wave and protect your bases. There are various bonuses, extras for hitting particularly nasty bugs, and so on.

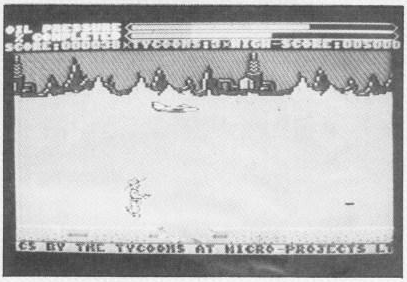
Worth looking out for.

Program: Hypercircuit, 64
Supplier: Alligata
Price: £7.95
Graphics: ★★★★★★
Sonics: ★★★★★★
Gameplay: ★★★★★★

Rootin' tootin'

Tycoon Tex is one of the better C16 efforts so far. Released by Gremlin at the same time as two other C16 programs, Xargon Wars and Petals of Doom, it's also a reasonably original idea, which makes a nice change.

Tex is a gun-toting oil tycoon whose mission is the patrol his pipeline defending it from all sorts of horrors — breaks in the line, bouncy springs, fighter attacks, arrows and bombs.



You control Tex's speed as he dashes along the pipeline, and make him jump to avoid the breaks. There's a time limit for the completion of each of the three screens — desert, ice and surface — but as you go faster the pressure in the pipeline builds up, so it's more likely to burst. If the oil pressure drops to zero, or if you run out of time, you've lost.

You have six lives and ninety-nine levels to complete, with options including keyboard/joystick, sound on/off, and so on. The background graphics are nice though the foreground characters aren't remarkable, and the sound's OK.

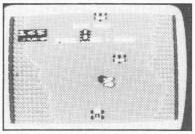
All in all, it's a decent pot-boiler, and I suppose we should be grateful that the basic idea is fairly original.

Program: Tycoon Tex, C16
Supplier: Gremlin Graphics
Price: £6.95
Graphics: ★★★★★
Sonics: ★★★★★
Gameplay: ★★★★★

Bumper cars

Krazy Kar is a version of the ancient arcade game which has been converted for the 64 a couple of times before, notable as Bumping Buggies from Bubble Bus.

It's a very straightforward game, in which you control a car seen on a racetrack from above. You steer from left to right, and can also accelerate and decelerate using the



joystick. Once you reach a certain speed, you are able — goodness knows why — to jump over your opponents, all of whom are land locked.

The opponents come in various shapes and sizes, ranging from racers to tanks. They all appear to behave pretty much the same though. You can destroy them by nudging them into the crash barriers, although this will cause you to lose speed.

There are narrow bridges and water jumps to negotiate before you get to the end of the course, and there are four phases — the four seasons — to complete. The music is nicely orchestrated, but was "Chitty Chitty Bang Bang" a contemporary choice?

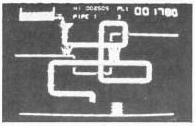
Very simple, and uninspiring graphically, though not uninteresting to play.

Program: Krazy Kar, 64
Supplier: IJK
Price: £6.95
Graphics: ★★★★
Sonics: ★★★★★
Gameplay: ★★★★★

In the pipeline

This is a follow-up to the original Super Pipeline, which was much praised when it came out last year. I can't see any point in owners of the original buying SP2, but for those of you to whom it's new, here's a resumé.

You control Foreman Fred as he patrols a water pipeline. A tank at the bottom top of the screen unloads into the pipe, which winds across the screen to a barrel at the bottom. The pipeline is attacked by multitudinous nasties including pneumatic drills, caterpillars and showers of tacks, which damage the line and let the water leak out. You must lead a workman to the leak, and defend him with your popgun until he's fixed the break. Once the barrel at the bottom has filled with water, your workers jump up and down with glee and you move on to the next screen, which features a longer



pipe and more, nastier enemies (including the infamous Venusian Pipe Spider).

The whole game is accompanied by the excellent theme music which is Taskset's trademark, in this case a medley of ragtime favourites.

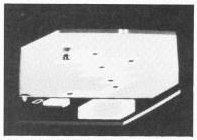
Jolly good fun it it's new to you, but, as I say, hardly such a huge improvement on the excellent original that it's worth having both.

Program: Super Pipeline 2, 64
Supplier: Taskset
Price: £8.90 cass, £11.99 disk
Graphics: ★★★★★
Sonics: ★★★★★★
Gameplay: ★★★★★★

Rock on

Rock'n'Bolt is the latest from Activision, and features the usual high standard of graphics and music.

It's a bit American, since the theme, high-rise construction, isn't really a familiar one for the UK audience. Still, certain things are universal. In this case you have a 100-storey building to construct, and you can play either against a clock



or to score maximum points with the lives allowed. Each storey has a blueprint, and the girders slide around the floor forming and reforming patterns. You have to control your little man to leap on the girders, and twirl around on the rivets to fix the girders in the right place according to the blueprints.

Some of the storeys are three screens across, so it gets pretty complicated, and you have to be prepared to rivet down girders in the wrong place and rearrange them later.

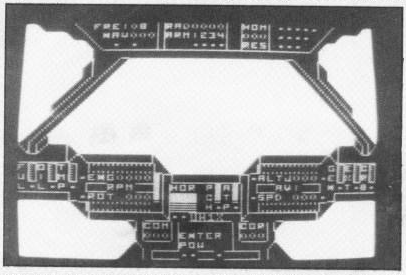
The whole thing is accompanied by breakdancing music of a really high standard, with some effects I've not heard used on the SID chip before.

Program: Rock'n'Bolt, 64
Supplier: Activision
Price: £9.99
Graphics: ★★★★★★
Sonics: ★★★★★★★★
Gameplay: ★★★★★★★

Whirlybird

Super Huey is a very complex and challenging helicopter simulation, which, due to Cosmi US's non-exclusive licensing agreements, is available over here both from US Gold and Audiogenic. Don't be confused when you see the two packs side-by-side on the shelves; the game is the same in each case, but Audiogenic has used two cassettes and US Gold one.

In each case you are presented with a detailed cockpit display and well animated background graphics. There are over 29 indicators to monitor, showing details of radar, homing beasons, oil temperature, fuel, armaments, speed and so on. You use the joystick for main control, and



can select from four missions. In Instruction mode, the on-board computer takes you through a series of exercises designed to familiarise you with the vehicle. Exploration lets you explore and map out new territories, and Rescue sees you saving lost soldiers from the uncharted jungle. The last option, combat, demands that you reconnoitre and defend the area surrounding a secret desert base.

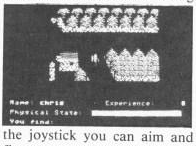
The game obviously sets out to be as realistic as possible within certain limits, and it succeeds in so far as the complexity of flying a helicopter is concerned. Bearing that in mind, this certainly isn't a game for fans of the mindless zapper — it's a simulation which will demand a great deal of effort to master, and will prove very satisfying if you're willing to put in the effort necessary.

Program: Super Huey, 64
Supplier: US Gold, Audiogenic
Price: £10.95, £8.95
Graphics: ★★★★★★★
Sonics: ★★★★★
Gameplay: ★★★★★★★

Shadows

It's interesting to compare Shades to Ultimate's Staff Of Karnath. Both are multi-screen arcade adventures involving a lone hero threatened by various monsters, searching a mysterious landscape for magical items to help him complete a vital quest.

In the case of Shades, the hero — in fact there can be up to four players — moves around the land of Arulan through scenes of forests, mazes and wastelands. Using



the joystick you can aim and fire your crossbow (if you can find it), and control keys allow you to open chests, search for invisible traps, get magical objects, inventory your possessions, plead with monsters (a novel option this, but not half as much fun as hacking them to death), and look for secret entrances.

The monsters aren't that terrifying they tend to wiggle at you furiously while making whining noises. The worst are the Shades, which will whisk you off to a previous location, meaning that you have to retrace your steps.

There's a scale showing your experience and strength, and you'll die if it falls to nothing through too many encounters with monsters. Overall the games ideas are quite interesting, though it hasn't been executed with much élan.

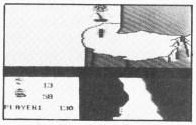
Program: Shades, 64
Supplier: Durell
Price: £7.95
Graphics: ★★★★★
Sonics: ★★★★★
Gameplay: ★★★★★★

Clam jam

Grog's Revenge is the sequel to the first game based on the popular American cartoon series BC, Quest for Tires. I'm not that familiar with the cartoon, so some of the funnies go over my head entirely — why, for instance, does Thor, the caveman searching for the meaning of life, have to collect clams? And what has he done to offend the Stentorian Grog?

Still, the game's quite playable. Thor teeters around on a unicycle, and you must control him along the mountain paths and through the darkened caves in his search for clams which lie around randomly. A map of the mountain helps you avoid the horrible Grog, but only your skill with the joystick can stop you from plunging over the cliff or bashing into the wall.

Once you've collected enough clams you can pass over a tollbridge onto the next screen, where you're



threatened by Tiredactyls.

This is the latest in a line of computer funnies which I feel are only ever partially successful — like comedy records, once you've heard the joke once it ceases to be amusing. Still, you might want to sing along with the chorus, and in the case of Grog's Revenge there's enough skill in the game that you may well be tempted to "play it again".

Program: Grog's Revenge, 64
Supplier: US Gold
Price: £9.95 cass, £14.95 disk
Graphics: ★★★★★★
Sonics: ★★★★★★
Gameplay: ★★★★★★

Your starter for 64

***Trevor Doherty** reviews Precision's Superbase Starter, a budget introduction to the pleasures of databases*

A DATABASE package will allow you to store, sort and retrieve information . . . in fact to generally manipulate all sorts of records of all sorts of things. Coupled with a spreadsheet and a word processing package, almost any task required to organise your home or business can be carried out. Of all the database packages available on the 64, Superbase has long been my favourite; easy to get started with, but when you become experienced it is capable of carrying out the most sophisticated data-processing tasks. In fact, for some home users Superbase is probably too powerful, providing many facilities that are rarely used. Precision Software has recognised this and come up with SUPER-BASE STARTER (£39.95, disk only). This should open up the pleasures of using this highly regarded product to many who have hesitated at the £90 price tag of the full Superbase.

Superbase Starter comes complete with an excellent manual, the first section being a tutorial to get you started, and the rest of it is a detailed reference section. There is a good index. When you send off your user registration card you can also obtain an audio learning cassette for £4.99. As if this weren't enough there is a 'Help' screen explaining each of the main facilities. The tutorial takes you through setting up your first file; the inevitable names and addressed file which is probably one of the early uses you will have for a database.

The procedure is very simple; first design your record layout on the screen (each file can have up to two screens of data per record), decide how long you want each piece of data to be, whether it is to be letters or numbers, or both. Once you have designed the screen you can set colours to highlight certain fields if wished. The file design is then saved and data can then be entered.

Each file can have up to 64 fields with a total of 1100 characters. A database can have up to 15 files associated with it, the number of records per file only limited by disk space. Once you have set up your data it can be recalled, individually one record at a time, or records matching certain criteria can be selected and output to screen or printer. A screen dump of any record can be done at any time. Calculations can be carried out, either as part of the record (for example a 'total' field derived by adding up several fields) or on a selection of records within the file. Records can be easily modified or deleted, and it is also possible to add further fields to an existing file once it has been set up and containing data, a feature rarely seen on database products.

The operation of Superbase Starter is via a series of menus accessed by the function keys, but you can also enter commands directly thus avoiding the menus, a feature I much applaud. The 'maintain' option allows you to carry out backups, format disks, look at directories and most importantly to 'import' and 'export' files. This important facility means standard sequential files can be read in to Superbase Starter, maybe produced by a spreadsheet.

Upgrade

Similarly you can 'export' data to other products, such as a word processor. If you are using Precision's own Superscript or Easyscript word-processor, there is a special facility which lets you, for example, write names and addresses to a 'fill file' which can then be merged with a standard letter to produce personalised mailshots. A most comprehensive range of printers is supported, standard Commodore, RS232, and Parallel (Centronics) interfaced. If you have a Centronics Printer you can use a cheap cable on the user Port, because Superbase Starter contains the conversion software.

Also included on the disk, is a labels utility which enables you to select fields from the required records in your file and produce labels. You can also buy 'Stepping Stones', ready to run applications for ten different business tasks at £9.99 each. These include 'Club Membership', 'Estate Agents' and 'Cash Book'. There is also available four 'Homebase' application packages covering such things as record collections etc. There are three applications on each Homebase disk at £17.95. Once you have bought Superbase Starter you can upgrade to the full Superbase for £49.95, or just add an additional 'sort' and a 'report' facility at £9.99 each.

The main difference between Superbase Starter and Superbase is the programming, reporting and advanced sorting facilities which exist on the full version. Superbase allows four screens of data per record with up to 127 fields, duplicate search 'keys' and has a memo writing facility.

Precision has just released Superbase 2 with some additional utilities. Existing users can upgrade. How can you decide which version you need? Unless you have a very complex application in mind, probably Starter will be all you require. The programming facility in the full version is a real boon if you have to run a lot of repetitive tasks on a large database, or set up custom designed applications to suit your particular requirements. It is easy to use, being an extension of Basic.

I've really got no gripes at all about Superbase Starter, and would recommend it in preference to Micro-Magpie (Audiogenic) at the same price, which I found difficult to use. Dialog's DFM is cheaper (£24.95), and good, but only offers a fraction of the facilities of Superbase Starter. If the American PFS:FILE (Software Publishing, £74) were cheaper I might consider that as an alternative. The upgrade policy, ready to use applications and the ability to link with other software, particularly Easyscript, is a real bonus for Superbase. As it stands, no contest; if you want an easy to use database for your 64 which provides powerful facilities I would say Superbase Starter won't disappoint you.■

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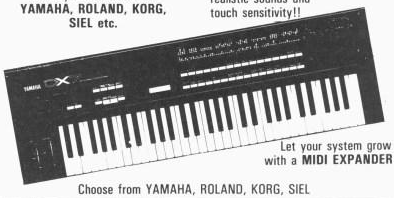

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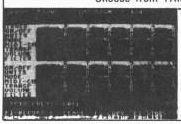

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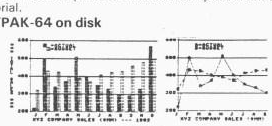

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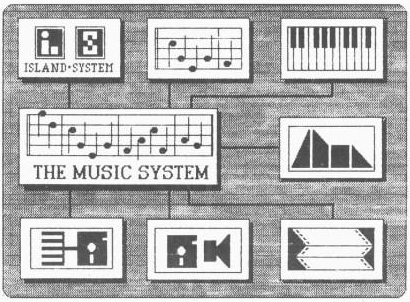
Electropop on the 64

This month's creative focus is on micro music, with an exclusive preview of Island Logic's Music System, a round-up of keyboards, and the latest on MIDI interfaces. Band aid courtesy of ***Mark Jenkins*** *and* ***Chris Jenkins***



ISLAND LOGIC'S Music System for the BBC B micro is probably the best sound package available for that relatively limited machine. Given the superior SID chip and extra memory available on the 64, there's no reason why The Music System couldn't become a very powerful piece of software.

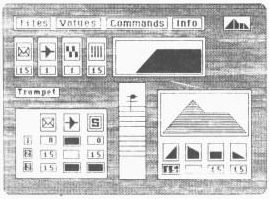
Well, it's not only powerful — it's AWESOME (this term, normally reserved for Jeff Minter games, is being used here for the first recorded time in connection with 64 music).

The 64 Music System, which should be on the market by the time you read this, not only includes sound synthesis, composition, editing and music print-out features, but has been extended to include MIDI functions. As with the BBC version, the whole thing is controlled by pop-up menus and icons which wouldn't look out of place on the Apple Macintosh.

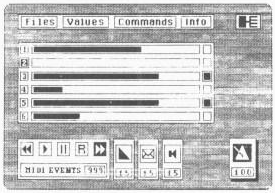
Island plans to market two versions, the Advanced Music System at under £30 and the Concise Music System, a one-screen cut down version, at around £15.

AMS consists of six modules accessed via a control screen. Each screen has a command line which allows functions to be selected, and graphics and icons to show you what you're doing at any time.

The Editor section allows the user to record pieces of music played on the QWERTY keyboard or MIDI synth. Sections can be defined and repeated, and The Notepad allows "cut and paste" functions so that different voices can be assigned to different musical lines. The



"sticks and dots" musical notation is very clear, and the speed and accuracy of the scrolling display unmatched by any other system.



The Synthesiser offers a large selection of predefined sounds, and full control over the SID chip's capabilities. This module includes a sequencer which allows a tune to be played through while the sound envelopes are being changed — clever things these interrupts!

Keyboard

The Keyboard, which can be used with Commodore's Music Maker clip-on keyboard, allows music to be played in real time, with the displayed note values changing according to how long the note is sustained (!). There's an animated metronome to help you keep time.

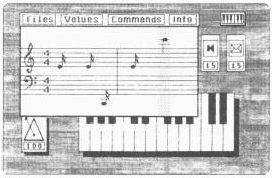
The Printer allows full musical scores, along with lyrics (! again), to be printed out on a wide variety of printers. There's even a facility for loading your own printer driver software in case your device isn't standard.

The Linker allows large compositions to be made up from different files. Each module can contain repeats, sections, and its own keys and time signatures.

Lastly, the revolutionary MIDI module allows any standard MIDI interface to be used to control a MIDI equipped synthesiser. The module can be used to record and play back multi-track polyphonic MIDI files. Up to six overdubs can be made, up to a capacity of 4000 notes. MIDI files can be used to play a MIDI synth or the SID chip (at a maximum of three voices, of course). Files can be edited and recombined if desired.

Island plans to make available a MIDI interface which should market at under £10 (compare this with SIEL's £99 interface), though there are no plans to sell this interface in a package with The Music System. The Concise Music System will probably be made available on cassette, and will be similar to the AMS Keyboard module, with around 30 preset voices.

SYSTEM software of Sheffield has collaborated with Island's own programmers to produce what may well be the only music software package you'll ever need. Despite sounding fearfully complicated, it's easy to follow the icon-driven program. Cheaper than MusicCalc, offering more facilities than Ultisynth or



any of the keyboard-package software, allowing control of MIDI synths (which are now coming down to the £300 price mark), and perhaps best of all, contained on one disk, The Music System may turn out to be the only piece of music software for the 64 that's worth serious consideration. ■

Island Logic, 22 St Peter's Square, London W6

Hitting the right keys

You can't play tunes on a QWERTY keyboard — so which of the many music add-on keyboards on the market is the best?

ASIDE FROM the clip-on Music Maker keyboard from Commodore, which is a fine start for musical beginners, there is now a wide choice of full-size music keyboards available for the Commodore 64. However, the hardware tends to be fairly standard, it's the quality of the software and the possibilities for expansion which will probably influence your final choice.

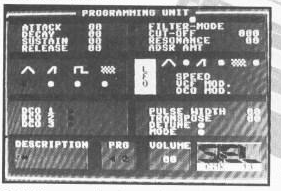
SIEL's CMK49 is one of the latest contenders. It's a full-sized four-octave keyboard in a smart plastic case matching the popular SIEL synthesisers. Costing £125, the CMK49 has a positive action similar to that of most modern synths.

Compactible

The big gimmick of the CMK49 is its MIDI compatibility. MIDI — the Musical Instrument Digital Interface which has become standard on most synths and computer musical instruments — allows the exchange of note information, tempos, programming changes and so on between instruments from different manufacturers — something of a godsend in the current atmosphere of incompatibility.

The CMK49's MIDI connection comes from the cartridge plug which clips into the back of the 64. Unfortunately the MIDI interface itself costs around £100 from SIEL, though there are cheaper alternatives available.

The CMK49's software is tape based, and contains a master program and library of preset sounds. The main menu offers the options Edit Play, Polyphonic New Sound, Monophonic New Sound, MIDI master keyboard, Disk/Tape Operation, and New Job. Most of these are self-explanatory. Edit Play enables you to scroll through the catalogue of preset sounds, some of which are very well designed. There are good Harpsichord, Piano and String polyphonic sounds, but the best ones, which use modulation effects such as vibrato and tremolo, are the monophonic (one note only at any time) Musette, harmonic and so on. There are also some special effects like UFO and Explosion.



CMK49 screen; background, the keyboard

The Edit function allows you to change any of these sounds or make up new ones. Although you can control the Attack, Decay, Sustain, Release, Filter Mode, and so on, not all of the 64's possibilities are exploited — you can't use mixed filters or separate ADSR settings for each voice.

The MIDI master keyboard option allows you to define a split point on the CMK49, then play two MIDI synths (or keyboardless synth expanders) from the CMK.

Although the software included isn't very ambitious, SIEL has plans for a sound expander, sequencer, possibly a sound sampler, and so on. Looking at the CMK49, you must remember that the software has no compositional elements at all — you can't store tunes and replay them. However, the forthcoming software should allow this, and it's perhaps better to get a simple initial package with expansion possibilities than to spend more money on a seemingly more complete system which might not be expandable in the future.

The LVL Echo 1 keyboard is less ambitious than the SIEL; again it has no compositional facilities in it's Organ Master software package, but this time there's no MIDI interfacing possibility. Again, the keyboard, which has a strong metal construction and costs £99, plugs into the cartridge port.

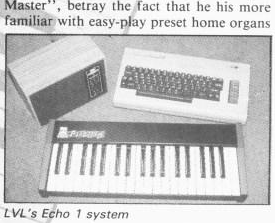
Synth

The Organ Master software comes on disk or tape, and has two main modes, Organ and Synth. Like the SIEL software, this means a set of preset sounds and a sound editing page. The Organ page allows you to select the preset sounds, which are perhaps inferior to the SIEL package's, but also allows you to control vibrato, tremolo, and filter on/off. Unusually, there is also a Single Key Chord feature, by which major or minor chords can be played on the Echo 1 just be pressing one key. An excellent feature for inexperienced players, though not one on which you should place too much reliance — it's not a good way to learn music.

In Synth mode, the bottom half of the screen is cleared to make way for a display of the SID chip parameters, which are controlled by various QWERTY keys.

ADSR, filter, waveshape, sync, resonance, master pitch (for tuning to other instruments) and so on are all set in this way, and can be memorised and recalled by pressing the Synth Voice Select key B. however, it doesn't seem possible to save settings to tape or disk for later use.

The LVL system is mechanically sound and bug-free, but seems hampered by the software author's lack of knowledge of synths. Phrases such as "Tab", the use of the single-finger chord feature, and even the name of the software package, "Organ Master", betray the fact that he his more familiar with easy-play preset home organs



LVL's Echo 1 system

than with modern synths offering many user-programmable voices, sequencing, dynamic sound control, and so on. It all adds up to give the package an old-fashioned feel.

More modern is the Music Mate system from Sequential (formerly Sequential Circuits, makers of the immensely successful Prophet Five, One, 600, T8, and SixTrak synthesisers).

The Music Mate keyboard is an unimpressive-looking three-octave affair which plugs into the joystick port, leaving the cartridge port free (though for what, isn't made clear).

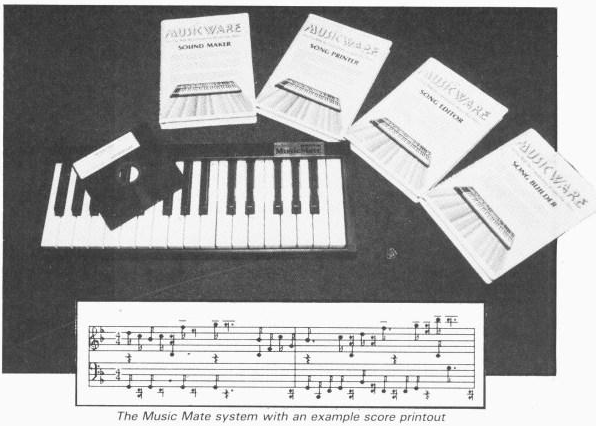
The software bundled with the keyboard isn't bad, though it's not ambitious. The master display shows a keyboard, a range of eight preset sounds, and parameters for the sound currently selected. The sounds, which include excellent bass and piano presets, are adjusted using the Function keys. Parameters available to change are attack, release, white noise level, filter amount and volume. It doesn't sound much, but you can achieve some good effects. Why on earth, though, have Sequential opted to use phrases such as PING, PEDAL and TONE rather than the accepted ATTACK, RELEASE and so on? If it's to appeal to a young audience, then I can only assume that American kids are even more retarded than we've come to assume. Anyway, the package also contains a simple Song Record option, which will record about ten minutes of your frenzied keyboard-bashing, then play it back in endless loops until you can't take it any more. If this has whetted your compositional appetite, you'll want to move on to Seqüential's other software packages to make full use of the keyboard.

Sound Maker gives you a modern-looking screen display with "knobs", "switches" and "indicators" which let you

control all the parameters of the SID chip. Again, there's some unnecessarily childish phraseology, such as WIND for white noise, but overlooking that, the package is very good. Having designed the sounds you want and tested them out on the keyboard, you can then save them to disk for use with the compositional packages.

Song Builder allows you to GET sound presets from disk, play music against a metronome, store the results and then recall them for arrangement into complete songs. Song Sections are made up of pieces played on three voices, and sixteen can be chained to make a Song. Any Section can be transposed when the Song is created, so you don't have to play the same piece in different keys. The results which can be achieved are very impressive, since each Section can use different sounds, at different volumes, different tempi, and so on. The final pieces can be stored, and then edited using the Song Editor package.

Song Editor can store up to five edited Songs on each disk used. Once you've selected the song you want to edit, a screen display shows the whole score in the form of conventional music notation, which can then be edited using function and cursor keys.



The Music Mate system with an example score printout

Printout

The final package, Song Printer, lets you take those edited songs and make hard copies of the scores using a Commodore printer — or, if you have a suitable interface, practically any high-quality dot matrix device.

In total, the Sequential Music mate and software packages seem to cover just about everything you can do with the SID chip short of delving into MIDI. Why bring out the packages on separate disks, though? I expect Sequential would argue that in that way, you don't have to pay for any packages you don't want. But since the system forms an integrated whole, it would be foolish not to have all the packages, so I suspect that Sequential will end up making more money than they would have by integrating everything in one.

The first Commodore 64-compatible music keyboard to become available, the Autographics Micrsound system, still has a lot more to offer than many other systems, including keyboard-mounted modulation sliders, a sound sampling option and possibly MIDI. However, since we're still waiting to see a working model of the completed system we'll leave the Microsound for another time.

With American, Italian and English products already on the market, and more such as the MusiCalc ColorTone and Melodian probably on the way, musical 64 owners can't say they don't have a choice. The perfect system hasn't yet been produced — all the synthesis, composition and printing software on one disk, a compatible keyboard with MIDI interface built-in, and so on — but no doubt it's on its way. The Japanese haven't had a go yet...

SIEL: Ahed Depot, Reigate Road, Hookwood, Horley, Surrey, 0293-776153

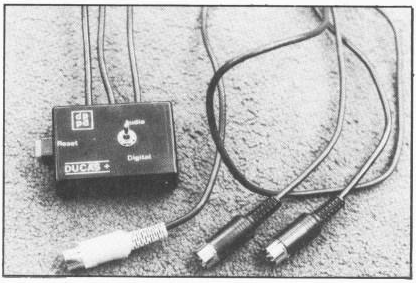
LVL: Scientific House, Sandiacre, Nottingham, 0602-394000

Sequential: Postbus 16, 3640 AA Mijdrecht, Netherlands

Tek's invaluable music box

IT'S ALL VERY well producing beautiful music using the 64's SID chip, but how do you save it for posterity? Filing on tape or disk is possible with some music systems, but most micro musicians will want to keep a record on audio tape.

This is where the Ducas+ comes in. It's a tiny black box with a switch and a button, featuring three trailing leads. Two connect to the DIN sockets on the back of the 64 — you'll have to disconnect your disk drive to use the Ducas — and the third lead is fitted with a five-pin DIN plug which will connect to most modern tape recorders.



When the switch is placed in the Audio position, you can record music tracks from your favourite games, or your own compositions, onto audio tape. You aren't restricted to just the SID chip's three voices; it's possible to produce multitrack recordings up to three overdubs.

Tek Services, producers of the Ducas+, will be demonstrating the unit with music products from SIEL, MusiCalc and LVL at the Commodore Show on June 7th, 8th and 9th at the London Novotel.

The Ducas also includes a reset switch, and comes with a cassette program, Renew, which allows you to rescue programs which have crashed. Using the unit in the Digital position, it's also possible to produce back-up copies of your programs.

The Ducas+ costs £15.95, and is available from Tek Services, 16A Appold St, Erith, Kent, 0322-341018. Tek also supplies a range of adaptor leads at around £4 each, which will allow tape recorders without DIN sockets to be used with the Ducas +

Mixing with the big boys

Allen & Heath Brenell's CMC 24 mixer interfaces with a 64 to make automated mixdown affordable for the serious studio musician

ONE NEW application for the 64 in music production takes owners into the realms of the massive professional studio — Allen & Heath Brenell's latest mixing desk gives you the chance to produce a fully professional automated mix of any piece of music, however complex.

When you're dealing with several synthesizers or other instruments, effects units, a multitrack tape machine, and so on, there has to be some way of pulling together all the possible sounds, sending them to various inputs and balancing the volumes and tones of all the signals involved.

Electronic Music on the Commodore 64 *by Mark Jenkins covers music hardware, software and programming. It costs £6.95 from bookshops or my mail from Sunshine Books, 12/13 Little Newport St, London WC2. Add 50p for p&p.*

The problem with multichannel mixing is that it's an art designed by an octopus for an elephant. Apart from needing eight hands to keep control, you need a prodigious memory to recall all the changes needed even in a five-minute song. But computers specialise in infallible memory and in handling figures, so microprocessor technology was called to the assistance of the mixing engineer relatively early in the day.

The CMC accepts 24 inputs from various instruments or effects and can add six effects in any amount to each input signal and combine the signals and effects into any one of sixteen outputs. It's ideally suited to the Fostex B16 recorder, the cheapest 16-track machine now available at around £3,000. The design is very compact; on the top right hand corner there's an onboard memory section, which allows you to store sixteen patches of "Mute" and "Route" information.

Digital

The digital memory aspects were initially introduced to save space, large numbers of routing switches making for an unwieldy design, but the memory system has its own advantages, particularly when you put the 64 in control. A multiway plug in the side of the mixer gives control to the 64 in conjunction with a CMI 64 interface carrying firmware for complex mixdown functions; the interface is around £200, but at least saves you having to load software every time you use the computer.

The first main display in firmware is a Channel Index with the date and time at the top of the page; this is simply a space for you to list what instruments or band members are connected to each channel.

After the Track and Take Index, we come to the Route Patching, which controls the input-to-output assignment; there are 56 Route Patch memories and 1024 Mute Patch memories available, with every channel listed and the symbols "/" and "*" representing On and Off for each channel. All you have to do is place the cursor over the channel you want to change and press the space bar to alternate between Open and Muted.

Mute patterns can be dumped to disk or cassette and you can put a name to each set, most obviously a song title. The most exciting part of the firmware, though, is the Sequencer, which allows you to enter a sequence of "Events" (complete mute or route patches) and step them along manually or from an internal or external clock – the computer can either follow the Beats Per Minute of your piece of music if you know it, or lock up directly to a drum machine (although this needs another cheaper interface, the CMS 24).

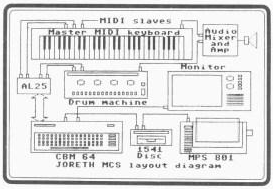
The design of the mixer makes this

Commodore-controlled package unique in home and semi-pro recording. The setup may seem expensive, but it offers 64 users facilities otherwise unobtainable without spending ten times more. ■

Joreth Music, 43 Brewer's Lane, Badsey, Evesham, Worcs, 0386-831615

Joreth's MIDI link-up

The Joreth Music Composer system for the 64 consists of two parts, the AL25 MIDI interface which plugs into the 64's user port, and the disk software. The interface has sockets for MIDI IN, three MIDI OUTs, Roland DIN sync IN and OUT, a footswitch jack for the "drop-in" facility, a mixdown switch, line sync/run, and a "panic button".



JORETH MCS layout diagram

But what does the system allow you to do? Basically, in conjunction with a MIDI-equipped syntheiser, plus optionally a Roland or MIDI drum machine, the Joreth system functions as an eight-track step-time or real-time recorder, with a capacity up to around 6000 notes. You can stretch this limit by using repeating sections of musical information, or by linking systems together to give you sixteen-track capability.

The first display asks you to select real time — in which notes are recorded exactly as you play them on the synth keyboard — or step time, in which each note played is assigned the same time value on playback.

The main options page allows you to determine your syncing options, note resolutions and tempo.

All you have to do to record a piece is to move the cursor to RECORD, press RERUN, select a track number from 0 to 7, choose a number of beats for the cue signal, and answer "Y" to the "NEW TUNE?" prompt. Then begin to play, and the system will record your performance on the synth.

To overdub the remaining seven tracks you follow the same procedure, with a display at the top of the screen showing the memory space remaining. Real Time mode has varying "quantisation" of the notes to pull them into more precise time if you so wish. Step Time mode is actually a modified version of Basic called Composer, which allows you to type in lines such as "E4G4C4" to define tunes, or to play them on the MIDI synth's keyboard.

Conventional musical notation is used to display your compositions, and staves can also be hard-copied to a Commodore printer.

Although the Joreth system has been criticised for using idiosyncratic terms such as "part" for track and "line" for sync, it's very powerful and can be customised by users with enough knowledge to exploit the operational routine information provided.

Allen & Heath Brenell, Pembroke House, Campsbourne Road, London N8, 01-340 3291

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ELITE

A QUESTION for you — what's the best game for the CBM 64? Ghostbusters? Raid over Moscow? Rocketball? Football Manager? You name it... ask any ten owners and the chances are you'll get ten different answers, and it's the same with all the other popular micros. Everyone has their own favourite. There is, of course, one exception to this Cook rule of thumb.

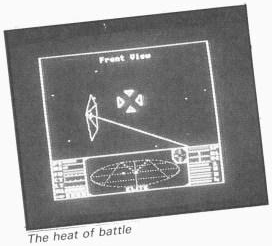
What's the best game for the BBC B? No competition; it has to be Elite from Acornsoft, the trading game/shoot-em-up/flight simulator that almost made the BBC machine worth buying last Christmas, which received nothing but universal acclaim from press and public alike last autumn.

Envious Commodore 64 users should feel agrieved no more, as that masterpiece of programing is now available as a Firebird Gold Edition (written by the same Cambridge team of Braben and Bell) as from May 20th.

It really is very difficult for even the best programmers to take a game written on one machine or processor, and transfer it to another without losing that certain something that made it so good in the first place. For every success — say Tir Na Nog or Lords of Midnight — you could name just as many failures, Ghostbusters being a celebrated example. That particular hatchet job had every 64 owner rolling in the aisles with great mirth over the Spectrum version, the said Sons of Sinclair being as sick as the proverbial nautical avian. So, it was with great trepidation that I approached the whole idea of playing a conversion of my favourite game.

Somehow it didn't seem right that I was sitting down in front of a Commodore (of all things), getting ready to blast Thargoids and maybe make a few fast credits trading narcotics.

While the game was loading I took a quick look at the accompanying literature. The same familiar Elite logo and artwork — good. A similar Space Traders Flight Manual — nice clear instructions well set out — again good. Ah...not so good...the same Acornsoft Boy-meets-Girl-meets-Thargoid Robert Holdstock novella. Space opera at its worst, recomended only for the combat tips heavily veiled within its 48 pages.



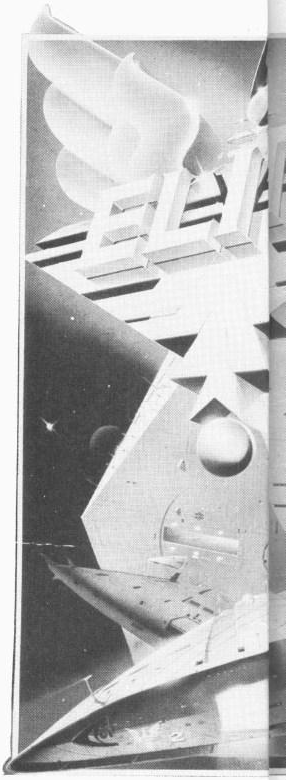
The heat of battle

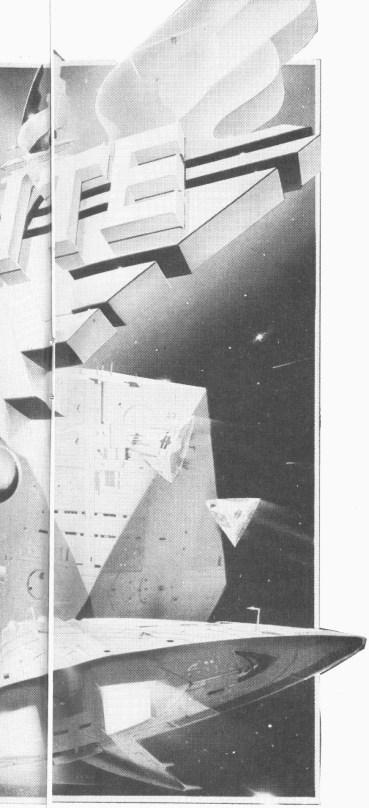
The game had finally loaded, and I was met with a very BBC-like display...redesigned character set and all. Very impressive, but how did it play? After the first foray into the unknown, it became obvious that despite being maybe five or ten percent slower than the Beeb, with CBM Elite, Firebird have a very successful conversion on their hands. The marginal loss of speed has been compensated for with the enhancement of a number of features which (like all good conversions) take advantage of the machine's strong points — in the case of the 64 — music and colour.

Elite programmers Braben and Bell worked on the 64 conversion themselves

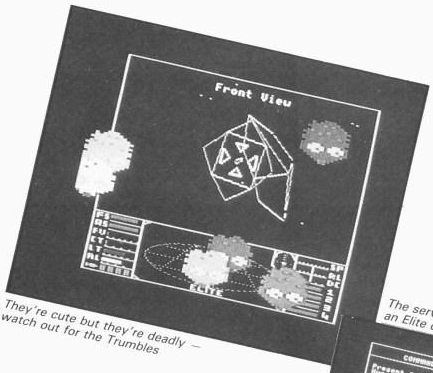
The main ship display is laid out exactly the same as before, with the black and white 'vector-scan' line graphics on the upper half of the screen (well, black and white until something blows up!) and the familiar instrumentation on the lower half. Here a little variety has been added, with the various flight parameters displayed in different colours. The main scanner also shows minor changes for the better — asteroids being displayed as red flags, Thargoids as green, and other ships in the familiar yellow. It's a shame that this new target descrimination didn't extend to cargo pods...but you can't have everything I suppose.

The other obvious differences are the on-screen laser sights (a different pattern for each type of weapon) and sound (a different noise for each). Cosmetic it may be, but neat. Some music might be included

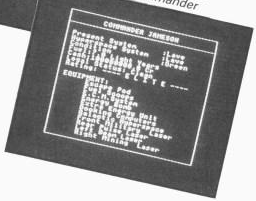

*Space cadet **John Coo** of interstellar tr*



Cook *tackles Firebird's game*
lar tra *ding and warfare*



They're cute but they're deadly — watch out for the Trumbles



The service record of an Elite commander

GAME: Elite
MICRO: CBM 64
PRICE: £14.95 tape, £17.95 disk
SUPPLIER: Firebird

in the final version (remember 2001?) but this has not been finalised even at this stage.

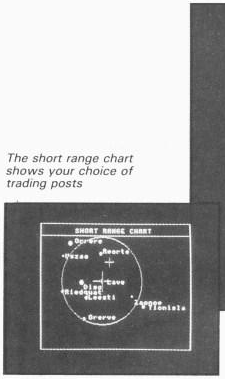
As far as combat goes, the programmers have taken advantage of the extra memory available to them, so that CBM Elite has all the ship types present in the flight manual...unlike the BBC tape (not disk) version which gave you Cobras, Pythons and Vipers...and that was your lot! Watch out for the Ferdelances and batten down the hatches I say.

I would advise against using your precious Energy Bomb on Thargoids as well — because it doesn't work! Not a bug, just a touch of mischevous programming sadism. Before we get thousands of 'unfair to traders' letters, there is the plus side that the system for combat rating (Harmless to Elite) has been revised so it no longer is just on the straight number of kills, it's now done on a points system — and the harder the opposition the more points you get. Two 'Special Missions' have also been included within the game, tasks that will be given to you as you roam the galaxies...I won't spill the beans, but they sound great fun.

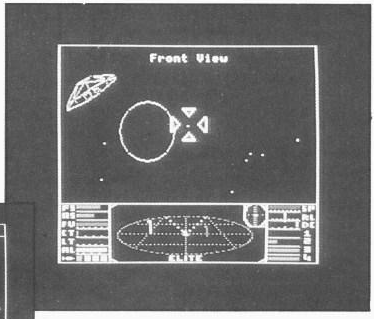
The trading aspect of the game has generally been left well alone, with the exception of a small potted description of each planet when you call up the data on the system, with slight overtones of Hitch-hikers around somewhere. For instance, Leesti is said to be, 'fabled for its Zero-G Cricket and Leestian Evil Juice.' While, 'Orerve is a dull planet.' These certainly liven up the early hours of the morning when you are still struggling to scrape up enough cash to buy yourself a military laser.

I have to say that despite expectations, I found Firebird's 64 Elite just as absorbing and challenging as the original BBC version, and it can get no higher compliment than that. It is slightly slower, but not (to my mind) significantly so, and the extra features certainly make up for this shortfall.

Finally, one little Elite extra I haven't told you about. Does anyone remember Tribbles? Ardent Star Trek fans will know what I mean. Good luck Jim, and beam me up. ■



The short range chart shows your choice of trading posts



Approaching the planet you run into trouble with pirates

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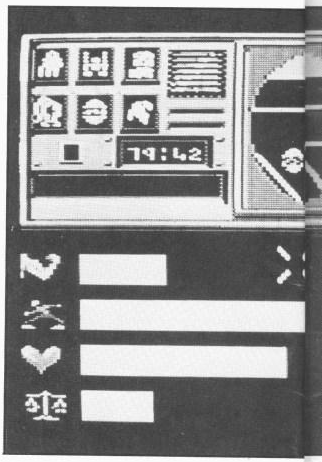


SHADOWFIRE

Beyond wrote an adventure — then got rid of the text. ***John Cook*** *explains icons*

I HAVE this theory that the type of people who enjoy playing text adventures are the same kind that like doing cryptic crosswords and word searches. The sort that would cancel an exotic holiday in order to take up the opportunity to do a blank jigsw.

It's not to say that I don't enjoy an intellectual challenge. I read the first chapter of "Zen and the Art of Motorcycle Maintenance" along with the best of them. It's just that I don't like blithely throwing myself at the mercy of some warped programmer's idea of English Grammar and my own dyslexia, as the combination of the two has proved, on several occasions, almost fatal.

Extensive research in this area has shown I am not alone in this opinion — and that's why I think Beyond are on to a winner with their new icon-driven adventure — Shadowfire.

"Icon" has become something of a buzzword recently, so perhaps it deserves some explanation. An icon is a visual representation of an object or action which is used to replace text input by the user. This type of system was first extensively used on 'executive' personal computers, such as the Apple Macintosh, and is only now beginning to move downwards towards the home market.

In Shadowfire, if you want to pick up, say, some tools, you move the cursor to a picture of a hand carrying a case, press fire, move it to a picture of some tools, press fire again, and hey presto, it happens — the tools are now shown on the part of the screen displaying the items in your possession. No messing around with "get tools" or maybe "pick up tools" or even, "collect implements."

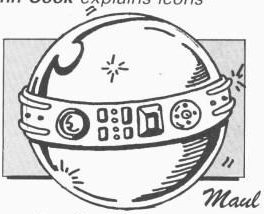
This idea alone would make Shadowfire interesting, but combine it with the novel futuristic "Mission Impossible" game concept, impressive graphics and sound (very well implemented) plus an optional software add-on to re-write the script as you desire (all courtesy of the talented Liverpool based Denton Designs team) and you are getting towards another 'Lords of Midnight' type hit for Beyond both in terms of quality and originality.

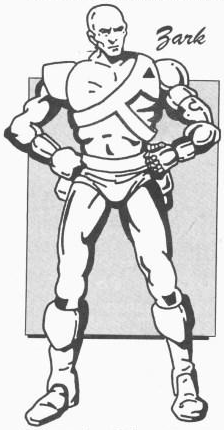
Within the game, you control a team of six characters; two humans, one insectoid, one avian and two droids — a crack team chosen by Enigma, 'a shadowy organisation dedicated to the Emperor's service.' The task is quite straightforward — you must rescue Ambassador Kryxix held prisoner aboard Zoff V, the skyfortress of the evil General Zoff, recently of the Imperial Navy. Kryxix has plans for a new hyperdrive hidden in a micro-disc embedded in his spine, plans which could mean the end of civilisation as we know it.

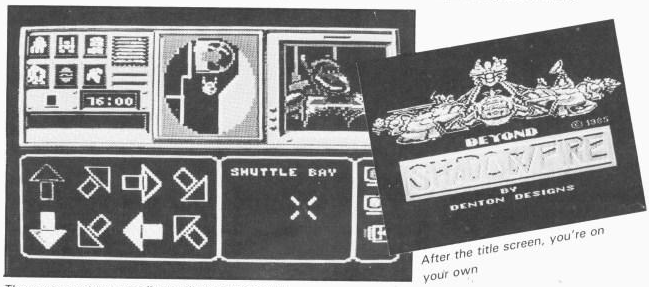
Naturally, Zoff V is very well defended . . . and you don't know where the Ambassador is being held prisoner . . . and just to make things a little more difficult, you have just one hour and forty minutes real-time to complete your task.

The team starts the game onboard their own space craft moored alongside Zoff V, so the first thing to do is to get the team onto said skyfortress using the transporter. The only character that can operate the transporeter is the driod Manto, and naturally, as your main task is to get the Ambassador back to the Enigma ship, if Manto gets taken out prior to that, you've lost.

Controlling the characters using the icon system is really a lot easier than it first seems. I would guess it takes people a full game of constantly referring to the manual (well written and set out incidentally before you feel really comfortable using it, but once mastered, it's a piece of cake.

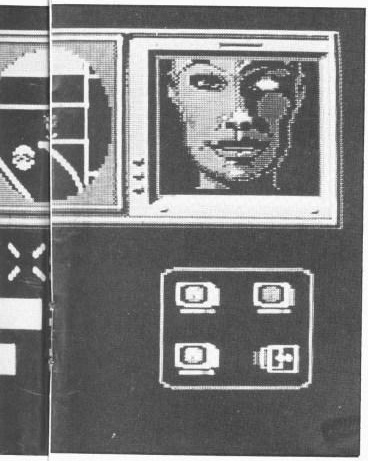






The movement screen allows directional control

After the title screen, you're on your own



GAME: Shadowfire
MICRO: CBM 64
PRICE: £9.95
SUPPLIER: Beyond

The cursor, controlled by joystick (although there are keyboard and lightpen options) is limited to the bottom half of the screen, the top half being a permanent Mission Command screen. The left-hand side of this screen shows the status of each team member (Attacking, Moving, Waiting, etc), and the time remaining (start panicking when it gets below 10), the remainder being taken up with a window through which short messages will occasionally scroll. The middle of the Mission Command Screen is occupied by a full colour display which shows the immediate surroundings of the character you are commanding at that time in plan view, a graphic of that character taking up the right hand side.

First of all, you select the team member you wish to command by placing the cursor over the appropriate graphic, and pressing fire. You then are shown that character's status screen, showing their Strength (if it reaches zero, they're dead), Agility (speed of movement), Stamina (roughly, endurance) and Weight carried.

Each character starts off with different statistics — Torik and Sevrina, fast but weak — Maul, slow but powerful — Syylk — an all-rounder, Manto — invaluable, but vulnerable — and Zark, talented mega-hero. Much of the enjoyment of the game comes with learning how to balance the various talents of the team with their weaknesses, as they battle their way through Zoff V.

The status screen also has options to move onto any of the other three command screens for that character (Object, Movement or Combat) or exit to select another team member.

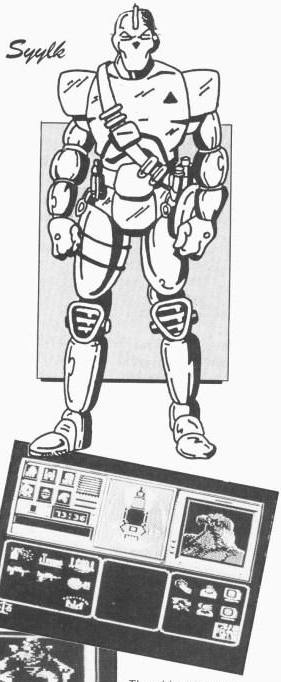
Teh game itself plays very well . . . you soon become absorbed into the Mission Impossible atmosphere, as you race against time to find Kryxix. Make a map, and guard Sevrina (locksmith extraordinary) and Manto . . . not forgetting that Zark also has his linguistic uses. As for the others, well . . . it is after all a suicide mission.

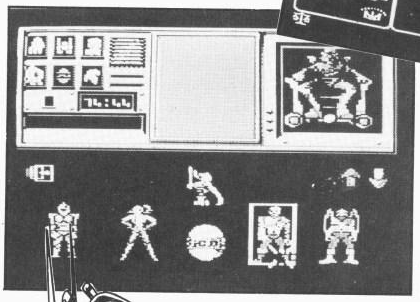
For those of you who are going to find it too easy, Beyond and Denton have come up with a little extra in the shape of the Shadowfire Tuner.

Originally developed by Dave Colclough, the game's programmer, as an in-house utility, it allows you to change the strengths of both the team and Zoff's defence, relocate objects and weapons . . . generally make it really difficult for yourself! Masochists will have to wait until August for this treat though, as Beyond wants you to get into the game on your own first.

So there you have it. A gripping adventure with no text, great graphics and a whole lot more.

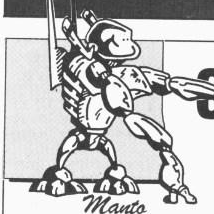
For those into one-upmanship, no, I haven't rescued Kryxix yet . . . but I've come close, and I'm not going to give up until I do. Now where did I put that joystick . . . somewhere back in the Goblin's Dungeon was it???? ■





The object screen allows selection of tools and weapons

The character screen chooses which warrior you control



COMPETITION

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SHADOWFIRE is unique — and so are the competition prizes we're offering. The Shadowfire T-shirts are a limited edition produced by Beyond, featuring fantastic illustrations from the game's internal artwork.

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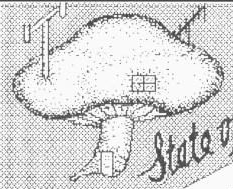
Send your suggestion with your name and address, and the T-shirt size you require — S, M or L — on a POSTCARD, to Shadowfire Contest, Commodore Horizons, 12/13 Little Newport St., London WC2H 7PP, to arrive by the last day of June. The fifty best suggestions will win the T-shirts. Normal competition rules apply, and results will be announced in the August issue.



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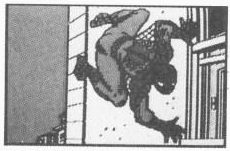
Watch and Marvel

Super-heroine ***Barbara Conway*** *weaves a tangled web with Spider-Man, visits the Emerald Isle and rediscovers The Hobbit.*

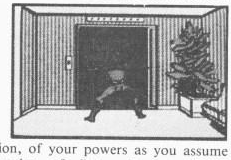
POW! ZAP! KERSPLATT! Oh, terribly sorry, didn't see you there. I was just getting into the spirit of Questprobe's latest brain-sizzler, based on that most vulnerable of super-heroes, Marvel Comics' **Spider-Man**. It so happens that I'm a lifelong fan of Spidey, and the wondrous world of Marveldom (stop sneering and try reading 'em, you may well get hooked too) so I have been awaiting this latest adaptation from Scott Adams with keen anticipation.



Also, before you get into any battles with any of the seven mighty villains lined up against you, check that your own defences are intact. One of Spidey's most valuable talents is the ability to throw synthetic webs at people and objects. Are you in a position to justify your nickname of the "web-slinger" and, if not, how do you rectify the situation. And remember that, to the likes of you, climbing the wall is a simple procedure.

Spider-Man is illustrated by clear Marvel-type pictures which can be influenced by the player since items collected will vanish from the screen. The instruction format can be considerably more complex than the usual verb/noun.

Initiates will find the accompanying mini-comic, which also contains a brief run-down on the characters, fairly helpful although it has little direct bearing on the plot of the adventure. But it does give you general hints about the extent, and limitation, of your powers as you assume the identity of Peter Parker, freelance photographer and angst-ridden super-hero, as you find yourself facing the likes of Otto Octavius (The Octopus) and the fiendish Electro while trying to collect and store the elusive gems. Again as in The Hulk, you will also find a bio-gem protected by a highly volatile Cosmic Egg which is set to vaporise anyone trying to grab the jewel.



You can talk to other characters and string commands together e.g. "Talk to Madam Web then go South". The disk version for the 64 has the facility to turn off the graphics, although cassette-users miss out on this useful time-saver.

Read the accompanying documentation about Spidey and the cast-list very carefully since, without getting an important hint about the way he gets certain of his powers, you may very well find yourself helpless against the villains. However many enemies you defeat, you only score points when you deposit the gems in the right place under friendly eyes.

I found Spider-Man more enjoyable than The Hulk, with plenty of puzzles and some superb graphics. Just remember, don't try to play in the sandpit, you don't know who it's been!

Back to home ground, and the good news is that Level 9 Computing have brought out another game, this time a one-off adventure called **Emerald Isle**. The not-quite-so-good news is that, although this package is well above the average standard, I'm not convinced that it meets the level of excellence we have all grown to expect from the Austin clan.

The Emerald Isle is hidden somewhere in the Bermuda Triangle, and you, as the innocent pilot whose craft has crashed into a mangrove swamp on the atoll, must either survive all its hazards to become King (or Queen, no sexism at Level 9!) or succumb to murderous fate which normally greets the island's involuntary visitors.

The game is liberally illustrated with high-quality graphics which can be turned off with a "words" command and the company says that it is designed to be "slightly easier to solve" than previous efforts although there are still plenty of puzzles and a very wide scenario. But somehow, although I enjoyed finding my way through Tree City (with its bad-tempered but surprisingly generous monarch), around the Desert and past the ominous spider, I felt that something important was missing. I'm not sure, but I think it may be the atrocious puns which we have all learned to groan at from Level 9. Getting the phrase book helps, but not enough. Emerald Isle is an extremely good adventure, but it could do with just a soupcon more of the old Austin bezazz.

Back to a *very* old favourite which has been given a thorough face-lift by Melbourne House. The software house has gone back to the program which established it in the top league of adventure providers, by producing a disk version of **The Hobbit** and, if the basic plot and solution is still pretty much the same, there are enough differences in the revised package to make it worth the attention of both newcomers and those already familiar with the perils of the goblin's dungeon.

The game comes on a double-sided disk with the player having the option of either being able to print out moves or to have pictures and music. I'd heartily recommend at least trying the graphics (which are on side "B" of the disk) at first since there are more of them, and they tend to be considerably more detailed, than in the original version. The music also deserves special mention. It is very easy for background music to become very irritating during an adventure, but I must offer my compliments to Neil Brennan, composer of the Hobbit "score", for achieving a remarkably Tolkienesque series of atmosphere-setters. They complement the quest very prettily.

The disk version contains more text description as well as the hyped-up graphics and, naturally, gives comprehensive saving facilities. Those who, like me, haven't played the game for nearly two years and thus have forgotten the whereabouts of several of the notorious "Hobbit" traps (the Trolls' clearing, the two dungeons, the pale bulbous eyes etc.) will be duly grateful.

Barbara Conway's adventure advice is available for the truly frustrated. Send your Commodore 64 adventure problems to Tower of Adventure, Commodore Horizons, 12/13 Little Newport Street, London WC2H 7PP.

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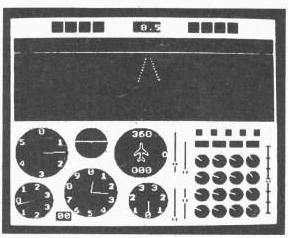

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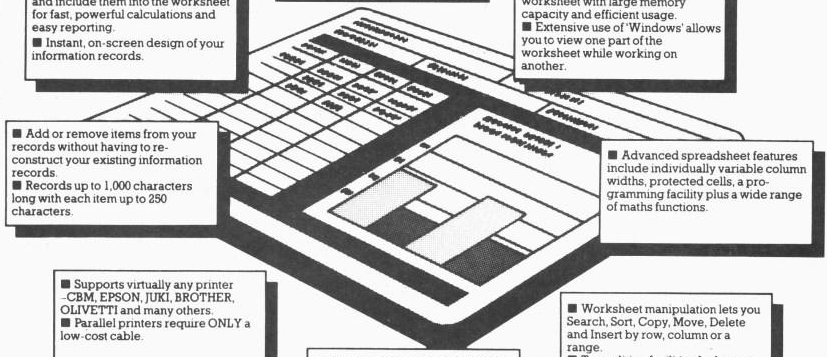

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Paging on the 64

***Adrian Warman** tinkers with 64 Basic and explain memory map manipulation*

ONE OF THE FIRST 'selling-points' encountered by the prospective buyer of the Commodore 64 Computer is the fact that it has 64K of RAM. However, only about 38K of this is given to the user when the machine is first switched on, a fact which tends to be quietly ignored. Nevertheless, as readers of the *Programmers Reference Guide* will be aware, it is possible to make the full 64K of RAM accessible to the User, although the means by which this is achieved are not detailed in the Guide. Furthermore, the trade-offs necessary to gain the full 64K are hardly described at all.

Paging

This article has two aims. The first is to show how memory map manipulation (or 'paging') is achieved on the CBM 64, and give details about what can and cannot be done as a result. The second aim is to show one use of this paging ability, in a manner useful to those amongst us who harbour a secret desire to "tinker" with Basic. Details will also be given of a few avenues of exploration for those people at fairly advanced levels of programming who are curious to investigate further.

If you were to take apart a CBM 64 computer, you would find a number of 'chips' that perform a variety of tasks such as producing sound, or pictures; and of course, the actual micro-process itself. If you start doing a few calculations (with the help of the Reference Guide), you would find that they amount to more than 80K of memory locations each needed by the system. How can this fit into a 64K machine? The answer is that the designers have "overlapped" certain memory areas into "pages". For example, at memory locations $A000 to $BFFF inclusive, there exists both 8K of (perfectly usable) RAM, and the very important 8K of BASIC ROM, without which you could not start to program! Naturally, these two items are not "active" at the same time.

When the machine is first switched on, the choice is automatically made to make the Basic ROM active. The RAM is deseledted, and is said to exist "behind" the Basic ROM — it is still present, but obscured by the BASIC ROM. The choice of which item is active is made by programming the 6510 Input/Output port at locations $0000 and $0001. Altering the value in the data register at location $0001 enables a selection of which items are present in a variety of memory locations. (It may be advisable to refer to the Programmers Reference Guide at this point.)

Hence if Bit 0 of the I/O data value is set to 1, locations $A000 to $BFFF will contain the Basic ROM code. Alternatively, if the bit is reset to '0', these locations will contain normal RAM.

Only bits 0 and 1 of the I/O data register affect the paging of memory in this way (although bit 2 controls whether the Character bit patterns exist in the memory — but since this is not executable program code, it will be ignored); however, between them, they do provide a set of useful combinations for selecting the various active pages. The effects of the various combinations may be summarised in the following table:

Value of Bit 1	Value of Bit 0	Effect
1	1	Normal System operation. BASIC and Kernal ROMs are enabled, as are the I/O devices.
1	0	Kernal ROMs and I/O devices are available, but BASIC ROMs have been 'switched-out'. Any attempt to use *any* type of BASIC command while the code in these ROMs is not active would result in a crash
0	1	A surprise here. Both the Kernal ROMs *and* the BASIC ROMs are switched-out. The I/O devices will still function, but a *lot* of work must be done to enable the computer to operate in a coherent fashion, since now there are no routines to handle interrupts, or to print a character, or even simply decipher keypresses.
0	0	This is a most interesting option for this section of the article. When both bits are reset to zero, *every* piece of ROM code is removed from memory. There are no ROMs or I/O devices. What you are left with is a complete 64K of RAM. (In practice, this is slightly misleading. As mentioned above, the 6510 chip uses locations $0000 and $0001 for its I/O register, so in fact you have 64K less 2 bytes of User RAM.)

So where does this leave the average CBM 64 User? Well, we now have a new variety of ways to produce some sudden and often spectacular crashes simply by POKEing into location $0001. But this in itself is of limited interest. The fun begins when you realise that it is possible to *copy* the data from the ROMs directly into the RAM behind them (assuming, of course, that the ROMs are currently selected). Having done this, then any removal of a set of ROMs would *not* produce a crash. Instead, we are left with a machine running under a 'Soft' language and Operating System.

Boot-strap

What is a 'Soft' language? More importantly, what machine(s) use them? A good general example of such a machine would be the "ideal" CP/M machine. It has a *very* small ROM routine (little more than a primitive machine code monitor) built into it, which is used to access the Disk drive as soon as the machine is Reset (or switched on for the first time). The effect of

the routine is to load the operating system (or language, or machine code program . . .) that is on the current Disk into the memory of the computer. Once loaded, the program is executed.

This process is often referred to as Bootstrapping, and it can quickly be seen that to use a different language (or operating system) on the computer, the User simply starts up (or 'Boots') using a different program on the appropriate Disk. This is obviously a lot cheaper than buying a new computer! It should now be apparent that a 'Soft' language resides in the RAM of a given machine.

The advantages of having a complete language and operating system in RAM rather than ROM should be readily apparent. If the code is in RAM, it can be altered! So how do we achieve that state of affairs on the trusty CBM 64? Simply by running the following program:

```
100 For X=40960 TO 49151
110 POKE X,PEEK(X)
120 NEXT X
130 FOR X=57344 TO 65535
140 POKE X,PEEK(X)
150 NEXT X
160 POKE 1,PEEK(1) AND 253
```

This program takes about one-and-a-half minutes to run and has no apparent effect. However, when the execution is finished, the Basic and Operating System (or Kernal) ROMs have been switched out, and the computer is now running on copy programs which reside entirely in RAM. A quick analysis of the above program would be instructive.

Lines 100-120: These lines copy the data in the BASIC ROM into RAM. Whenever a PEEK is made into the memory from 40960 to 49151 inclusive, the value returned reflects the contents of that address (naturally enough). If the RAM was active, then the value would simply be the current contents of the memory location (which could alter, of course).

Conversely, if the ROMs were active, then the same value would always be returned, just as you would expect. However, a POKE into these locations will *always* put the data into the RAM, regardless of whether the RAM is active or not. This explains the peculiar line 110, which takes each Byte of the BASIC ROM in turn, and stores a copy of it in the corresponding RAM location.

Lines 130-150: These lines perform a very similar task to those in 100 to 120, the difference being that this time, it is the *Kernal* ROM that is being copied into RAM, rather than the BASIC ROMs.

Line 160: This line switches from the ROM to the RAM.

Why is no effect visible once this program is run? It is because as far as the micro-processor is concerned, absolutely nothing happened. It is still running the *same* code for the BASIC and Operating System — and the fact that the data for these programs is now coming from RAM instead of ROM is completely irrelevant. It should be noted that at any time, if you wish to restore the genuine ROMs, simply perform a warm start (RUN/STOP-RESTORE). This will switch the ROMs back into position.

The second aim of this article is to wander through the depths of the ROM code. It will be assumed for the rest of this article that the ROMs have been copied into RAM by the above program. It may be advisable when first experimenting to start anew with each section below by performing a warm start (as described above) and then re-running the copy program. This will prevent any confusion from the cumulative effects of the tinkering. Later on as you grow more confident in tailoring the code, you can leave changes as they are.

The majority of the information given refers to the Basic code; since this is the main interface between User and Machine, and so any changes are more obvious in effect. However, we can start by briefly looking at some locations in the Kernal ROM, just to get the idea.

Cursor

First of these is the cursor repeat speed. Many readers will have observed that the Programmers Reference Guide mentions the system locations 'Kount' (at $028B) and 'Delay' ,(at $028C) which apparently control (respectively) the repeat speed and the delay before repeat occurs. If you have noticed these, you probably tried POKEing them to see what effect they had, and were then disappointed to see that nothing altered. The reason is that these locations are just *counters* controlling the repeat characteristics. In order to actually change the delay and speed of repeat, it is necessary to alter the *start* values of these counters. These were previously stored in the Kernal ROM, but now that the data is copied into RAM, we can get at them! Try the following instructions once you have to run the copy programs:

```
POKE 60189,x
```

This location controls the repeat speed of the cursor. The default value of 'x' is 4. If you make 'x' smaller, the cursor will molve more quickly; and making 'x' larger will make it move more slowly. Similarly:

```
POKE 60138,y
```

. . . is the location which controls the delay before the cursor begins to repeat. The default value of 'y' is 16. Making 'y' smaller will cause the cursor to repeat sooner; and of course, making 'y' larger will produce a longer delay before the repeat starts.

There are a number of other sections of code in the Kernal program which are interesting, such as the interrupt routine which services the clock and the keyboard. However, tinkering with these is a more complicated procedure since any error will almost certainly produce a crash. In addition, the complexity of the Operating System tends to prohibit simple alterations. We will now consider the more friendly environment of the BASIC ROMs, where there is plenty to interest the average "hacker"!

As mentioned above, the Basic ROMs form the main interface between User and machine. As a result, it is here that we find the stored data for BASIC Keywords, System messages and prompts, and the majority of the routines that we take for granted.

Once of the more common questions asked by Commodore owners is how the '?' prompt for INPUT can be altered. There are a variety of ways — one is to make the INPUT using files rather than from the keyboard, which has the advantage that no prompt is issued unless you print one yourself. Another way that interests us in this article is to physically change the prompt symbole. The '?' character is stored at location 43846 as an ASCII character. Hence its default contents are 63. Once we have run the above copy program, we can poke any value we like into this location, and it will change the prompt. For example:

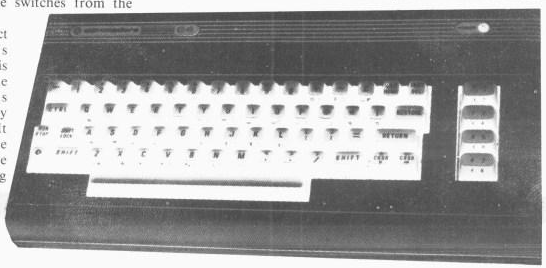
```
POKE 43846,62
```

. . . will change the input prompt into a '>'. Rather an interesting value to use is 18. It will appear as if no prompt is printed, but in fact this value is the 'Reverse On' character, and so anything you type will show up in 'Reverse', which is a good way of highlighting User responses to questions from the computer. If you want to prevent any prompt, simply use the value 0.

Errors

As with most things, making this simple change *does* have side effects. The '?' characters is not used only for input prompts. It is also used as the first character in error messages. Remember the infamous '?SYNTAX ERROR'; for some reason Users get so used to seeing errors that they overlook the '?' at the beginning. When tinkering. with BASIC, it is important to watch out for things like this, as otherwise you could encounter some *very* odd effects indeed.

However, in this case the side effect is not drastic. You can either prevent the effect by restoring the '?' character when you have finished your input, or else you can try and use it to your advantage. If we set the value to be 18 (which is the reverse



on character), then not only will any input characters be in 'reverse', but so will error messages!

There are a surprising number of ASCII sequences in the BASIC ROMs which fall into this category. As well as all the BASIC Keywords, there are the Error messages and various System prompts. There are two formats in which these messages are stored, and we will now look at them both with the help of some interesting examples.

The first type of sequences are those of standard ASCII characters, with the message terminated by an ASCII 'NUL' character, number 0. One such messae (and a very important one!) is 'READY.', which is stored at locations $A376-$A380 (41846 to 41856) inclusive. You will notice that this is more than the number of characters actually observed on the screen. A simple program to look at the contents of these locations would reveal the following *ASCII* symbols.

(CR), (LF), R, E, A, D, Y, ., (CR), (LF), (NUL)

. . . and note that because these are ASCII symbols, (CR) means 'Carriage Return', and (LF) means 'Line Feed'. When the computer decides that it is time to print the 'READY.' message, it accesses this short table and prints each character until the NUL is encountered. On the Commodore computers (when printing to the screen), the (CR) symbol moves the cursor down to the start of the next line (scrolling if necessary), and the (LF) symbol has *no* effect.

We shall now change this sequence slightly, so that an entirely new prompt is produced. When the copy program has been run, try the following program:

```
100 FOR X=41846 TO 41856
110 READ Y
120 POKE X,Y
130 NEXT X
140 DATA 13, 10, 62, 32, 00, 00, 00, 00,
00, 00, 00
```

I will not tell you what the program does, simply that the effect is somewhat different from the usual Commodore prompt, so you must try it for yourself!

There are several other messages using this format. Locations $CFC-$AD1D (44284 to 44317) contain the non-fatal error-messages '?EXTRA IGNORED' and '?REDO FROM START'. These particular messages are especially interesting for two reasons. Firstly, they are non-fatal, which means that program execution will continue even though an error has occurred; and secondly, the '?' character at the start of these error messages is *not* the same as the prompt that we were altering above. Hence any tinkering with location 43846 will not affect these messages.

The second (and more common) format for message storage is different mainly in the way that the end of the message is determined. In the previous format, a message was terminated by the ASCII 'NUL' character. The second format indicates termination by setting Bit 7 of the *last* character to a '1'. For example, in the SYNTAX error text charactrs, the codes are stored as follows:

S	Y	N	T	A	X	
53	59	4E	54	41	D8	(Hex value to show Bit 7)
83	89	78	84	65	216	(Decimal value)

This format is by far the most important, because it is the format used for storing all the BASIC Keywords. The next section of this article will now consider how we can actually 'manipulate' BASIC Keywords themselves.

There are a large number of BASIC Keywords and Operators, and to give a full description of their use (and how to alter them) is beyond the scope of this article. However, we will discuss a little of their structure and look at the way in which some of the simpler modifications can be achieved. The table below is a summary of data for most BASIC statements (although functions and operators are not included, the principles are similar), and shows the Keyword, the position of its text sequence, the normal value of its action vector, and the position of that vector. To see how the table works, we shall perform a simple change that may be of interest to those who like finding ways of protecting programs.

For this example, we shall alter the LIST Keyword to perform an entirely different task, namely to act as a REM. We could of course choose a 'destructive option' such as making LIST perform a NEW, or even to execute some of our own machine code for (say) a really spectacular crash!

We can see that the vector for REM is stored at $A02A (41002), and has the value $A93A (43322). Similarly the vector for LIST is stored at $A042 (41026). All we have to do in order to make LIST act as a REM is to alter the LIST vector to point to the REM routine. This is done by the following program:

```
100 POKE 41026, 43322-INT (43322/
256)*256
110 POKE 41027, INT (43322/256)
```

Having done this, any attempt to perform a 'LIST' will behave as if REM had been entered instead of LIST!

Strictly speaking, the action vector for each of the keywords does *not* give the start address of the appropriate routine, but is in fact one location less. The reason is to do with the way in which the BASIC operates, but since this rule applies to *all* the action vectors, we can ignore it.

But what if we are bored with having to enter LIST in order to display any lines within a program? It is possible to alter the Keyword table in BASIC so that we could make an alternative word of any length that we liked, but this is more complicated, and so we will here assume that we cannot use more characters for a keyword than are already present in the default word. Thus, instead of LIST, we could have 'TYPE' or 'SHOW'. For this example, we will select the latter, namely 'SHOW'. To redefine 'LIST' into the word 'SHOW', run the following program:

```
100 FOR X=41229 TO 41232
110 READ Y
120 POKE X,Y
130 NEXT X
140 DATA 83,72,79,215
```

From this point on, any attempt to use LIST will produce a syntax error. Instead, you must use the new keyword, 'SHOW'.

Just as you would expect, in the same way as you can use 'L', 'SHIFT-I' as an abbreviation for 'LIST', so when you have altered the Keyword to 'SHOW', you can now use 'S', 'SHIFT-H' an an abbreviation.

I hope that this excursion into the inner depths of the System ROMs will show that even those unused to machine code programming can at least 'play around' with the system in such a way as to be enjoyable without being to difficult. ■

BASIC Keyword Table

Keyword	Store	Action Vector	Vector Store
END	$A09E 41118	$A830 43056	$A00C 40972
FOR	$A0A1 41121	$A741 42817	$A00E 40974
NEXT	$A0A4 41124	$AD1D 44317	$A010 40976
DATA	$A0A8 41128	$A8F7 43255	$A012 40978
INPUT#	$A0AC 41132	$ABA4 43940	$A014 40980
INPUT	$A0B2 41138	$ABBE 43966	$A016 40982
DIM	$A0B7 41143	$B0B0 45184	$A018 40984
READ	$A0BA 41146	$AC05 44037	$A01A 40986
LET	$A0BE 41150	$A9A4 43428	$A01C 40988
GOTO	$A0C1 41153	$A89F 43167	$A01E 40990
RUN	$A0C5 41157	$A870 43120	$A020 40992
IF	$A0C8 41160	$A933 43315	$A022 40994
RESTORE	$A0CA 41162	$AB1C 43036	$A024 40996
GOSUB	$A0D1 41169	$ABB2 43137	$A026 40998
RETURN	$A0D6 41174	$ABD1 43233	$A028 41000
REM	$A0DC 41180	$A93A 43322	$A02A 41002
STOP	$A0DF 41183	$A82E 43054	$A02C 41004
ON	$A0E3 41187	$B79A 43338	$A02E 41006
WAIT	$A0E5 41189	$B82C 47148	$A030 41008
LOAD	$A0E9 41193	$E167 57703	$A032 41010
SAVE	$A0ED 41197	$E155 57685	$A034 41012
VERIFY	$A0F1 41201	$E164 57700	$A036 41014
DEF	$A0F7 41207	$B3B2 46002	$A038 41016
POKE	$A0FA 41210	$B823 47139	$A03A 41018
PRINT#	$A0FE 41214	$AA7F 43647	$A03C 41020
PRINT	$A104 41220	$AA9F 43679	$A03E 41022
CONT	$A109 41225	$A856 43094	$A040 41024
LIST	$A10D 41229	$A69B 42651	$A042 41026
CLR	$A111 41233	$A65D 42589	$A044 41028
CMD	$A114 41236	$AA85 43653	$A046 41030
SYS	$A117 41239	$E129 57641	$A048 41032
OPEN	$A11A 41242	$E18D 57789	$A04A 41034
CLOSE	$A11E 41246	$E1C6 57798	$A04C 41036
GET	$A123 41251	$AB7A 43898	$A04E 41038
NEW	$A126 41255	$A641 42561	$A050 41040

PC compatible?

What is the PC standard? Why is IBM's PC so important? And how does the Commodore PC compare on price and facilities? ***Trevor Doherty*** *answers the questions and finds out what the PC can offer you*

COMMODORE have taken what for them is a unique step; they have introduced a machine which is compatible with someone else's standards. In this case the standard is that of IBM, and that is now the 'industry standard' for Personal computers. To understand the importance of this, you need to look at what has happened to the business personal computer market over the last three years.

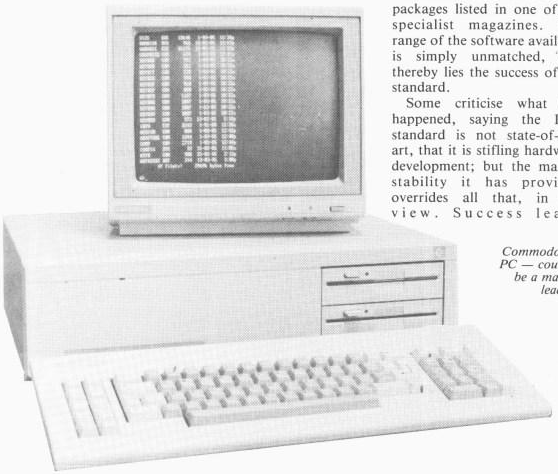
Bewildering

Before IBM introduced their PC (it began to be available in the UK in 1982), there were numerous, mainly 8-bit business machines on the market, with a bewildering variety of standards, including Commodore's own PET series, the early Apple models and a whole clutch of other machines which operated under CP/M, the first real standard operating system for microcomputers. In the UK Commodore machines were probably the biggest sellers, indeed Commodore estimate there are still some 120,000 in use today. Whilst the CP/M operating system did offer a standard, there was still a wide variety of disk formats, making it difficult for software to run on more than one make of machine. All this changed when the massive IBM Corporation decided to enter the Personal Computer market.

Looking at the situation in 1985, the UK scene is a whole lot simpler. There are the 16-bit IBM and IBM compatible machines taking the lion's share of the market (particularly in the Corporate sector), and then there is Apple, still selling some 8-bit Apple IIs, plus the revolutionary 32-bit Macintosh. Everything else is really small beer.

So what is this IBM standard? Well, at the very least it is the ability to run the MS-DOS operating system, usually using a 16-bit Intel 8086 or 8088 processor chip. Preferably it also includes hardware constructional compatibility so that standard sized additional printed circuit boards (or 'cards') can be added to extend the machine, for example to add additional communication facilities. The degree of compatibility varies enormously. The major effect of this standard has been the creation of an enormous amount of software, chiefly but not exclusively, business software which will run on these machines. I counted over 800 packages listed in one of the specialist magazines. The range of the software available is simply unmatched, and thereby lies the success of the standard.

Some criticise what has happened, saying the IBM standard is not state-of-the-art, that it is stifling hardware development; but the market stability it has provided overrides all that, in my view. Success leads to software availability and software availability leads to success, a difficult cycle to break into for any new machine. In its own way the 64 is in a rather similar position in the home machine market, thus the excellent range of software for the 64. The attempt to establish a new standard for home machines, MSX, doesn't seem to have met with much success.



Commodore's PC — could it be a market leader?

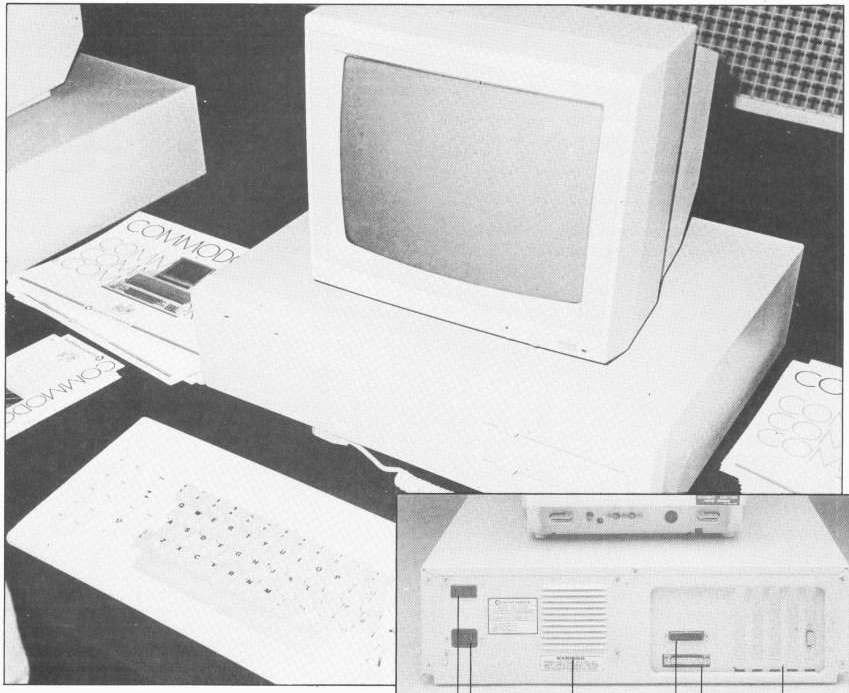
One recent development in the States is that the IBM standard is starting to have an impact on the home market, as people trade up from their Apple II's. The trend is definitely towards more 'serious' home computing, as people get bored with games, and that enormous stock of IBM compatible software just cannot be ignored. The upgrade doesn't come cheap; a Commodore PC is around four times the price of a 64 with disk drive and monochrome monitor. Still, the American home computer buyers are better able to afford PC's than the UK users.

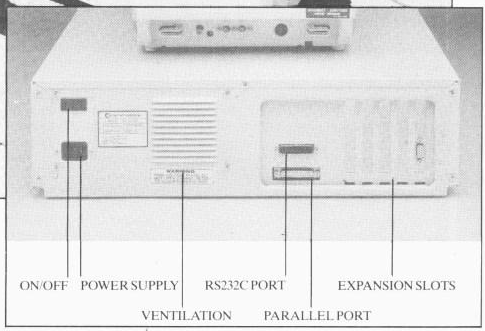
Loyalty

What about this Commodore PC? Will it make any impact on the IBM compatible market, or will it just be 'another IBM compatible'? Only time will tell, but some factors are worth considering. One, the machine is extremely compatible, both hard and software-wise. (In fact I wish they hadn't been quite so slavish when copying the keyboard, which provides the awful IBM cursor key arrangement on the numeric key-pad — terrible to use with spreadsheet programs.) I took an IBM version of the Vizawrite word processor to the launch and it booted straight up and ran perfectly. Commodore don't claim 100% compatibility with all software, but indications are the Commodore PC is one of the most compatible machines available.

Secondly, the price, at 25% below the equivalent IBM, places it very close to the cheapest fully IBM compatibles on the UK market.

Thirdly, Commodore's strength in the business computer market in the UK with the PET series could give them sufficient brand loyalty to give them a helpful boost in market share. However, by the time you read this, IBM may have announced the strongly rumoured PCII with a faster processor, 3.5 inch disk drives, and probably 20% cheaper than the original PC . . . ■





SPECIFICATION

● CPU
8088 Processor.
8087 Co-processor (optional).
4.77 MHz clock rate.

● Memory
Main RAM size.
256K RAM Standard.
Internally expandable to 512K.
Externally expandable using full length expansion boards to 640K.
ROM size
Standard 8KB.

● Display
12'' CRT (non glare phosphor green).
14'' medium resolution RGBI colour monitor (available shortly after launch).

Alphanumeric B/W char resolution 9x14.
80x25 character display.
Colour and Hi-Res graphics are not in the standard configuration at launch.

● Storage
Dual 360K/byte, 5¼'' double density, double sided disk drives (PC-10).
Format: IBM® compatible): 40 tracks, 9 sectors/track.
or
Single 360K/byte, 5¼'' disk drive plus 10M/byte hard disk.

● External Storage
The internal floppy disk controller is able to handle up to 4 drives.
Controller is capable of supporting two Winchester drives with a capacity of up to 70M/bytes per drive.

● Expansion
5 full sized PC compatible expansion slots.

● Keyboard
Detachable keyboard.
85 keys including 10 function keys and numeric keypad.
Meets European DIN requirements.

● Interface
Parallel Printer port (Centronics)
RS232C port.
Monochrome video output.
Composite B/W video output (not in the standard configuration at launch).

● Operating System
MS-DOS.

● Language
GW Basic.
Optional programming languages: Cobol, Fortran, Pascal, Macro Assembler etc.

● Physical Specifications

Base Unit (CPU)	Ht 14.5cm
width 49cm	depth 39cm
Monitor	Ht 27.7cm
width 30.3cm	depth 29.3cm
Keyboard	Ht 4.0cm
width 49cm	depth 17cm

● Power Supply
CPU 240 VAC 170 watts, 50Hz.
Monitor 240 VAC 30 watts, 50Hz.

● Price
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£2,795 for the hard disk model, the PC20.

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Clock Speed	4.77 Mhz
Memory	Main 256K RAM (expandable to 640K) Video 32K RAM ROM 8K or 16K
Display	12'' monochrome CRT (green phosphor) Screen formats: Monochrome alphanumeric 80 x 25 Monochrome graphic 640 x 200 pixels Monochrome graphic 640 x 352 pixels Alphanumeric attributes: High intensity, reverse video, blinking Underlining (monochrome only)
Keyboard	Detachable 84 keys, including 10 function keys
Interfaces	Parallel port — Centronics Keyboard Serial port — RS232 RGBI Composite monochrome Five expansion slots (for PC compatible PCBs) Power
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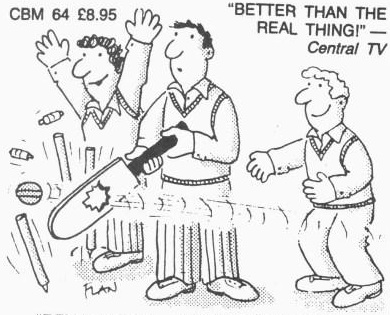

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THIS PROGRAM for the unexpanded Vic 20 comes from Michael Turner of Brierley Hill, West Mids

MUSIC BOX is a sound sequencer for the Vic 20. It turns your Vic into a music keyboard with a 100 note memory. When you run the program you are asked which voice you require, 1 to 4. 4 is white noise. You then input the length of the notes you wish to play, the shortest possible being 1 and the longest 0.01.

Play your tune using all the keys except 0-9, using N or Y to insert pauses. When you've finished, press F7, select a playback voice, and after an interval of a couple of seconds your tune will play back. Press space to insert pauses in playback, and press 0 to return to the beginning of the program.

```
0 REM***************
1 REM**MUSIC MAKER**
2 REM******BY*******
3 REM****M.TURNER***
4 REM***************
6 CLR:DIMO(100)
7 POKE36879,D
8 PRINT"■"
9 PRINT"■"
10 PRINT"■■■■■■■■■■■■■■■■■■■■■"
11 PRINT"■■    MUSIC MAKER   *"
12 PRINT"■■   BY M. TURNER   *"
13 PRINT"■■■■■■■■■■■■■■■■■■■■■"
14 PRINT"■■■■■■■■■■■■■■■■■■■■■"
15 PRINT"■■  WHICH VOICE1-4  *"
16 PRINT"■■■■■■■■■■■■■■■■■■■■■"
17 INPUTR
18 IFR<1ORR>4THEN17
20 R=INT(R)+36873
25 POKE36878,15
30 DIMZ(100)
35 PRINT"■DURATION OF NOISE/NOTE■"
36 INPUTDR
40 IFDR>1ORDR<0.001THEN36
45 READP:IFP=0THEN60
50 READZ(P)
55 GOTO45
60 GETA$:IFA$=""THEN60
65 IFA$="0"THENRUN
70 IFA$="■"THEN145
75 IFA$="1"ORA$="2"ORA$="3"ORA$="4"THENGOSUB115:GOTO45
80 P=ASC(A$)
82 IFA$="O"THENP=79
84 IFA$="N"THENP=78
85 FORD=1TO10:NEXT
90 POKER,Z(P)
95 PRINT"■":POKE36879,Z(P)
100 FORD=15TO0STEP-DR:POKE36878,D:NEXT:POKER,0:POKE36878,15
105 V=V+1:O(V)=Z(P):IFV=100THENRUN
110 GOTO60
115 POKER,0:H=VAL(A$):S=H+36873:RETURN
120 DATA81,135,87,143,69,147,82,151,84,159,69,163,85,167,73,175
125 DATA79,179,80,183,64,187,42,191,92,195,65,199,83,201,68,203
130 DATA70,207,71,209,72,212,74,215,75,217,76,219,58,221
135 DATA59,223,61,225,13,227,90,228,88,229,67,231,86,232,66,233
140 DATA79,235,77,236,44,237,46,238,47,239,17,240,29,24,0
145 PRINT"■■MUSIC MAKER MEMORY■"
150 POKE36879,8
155 INPUT"WHICH VOICE";S
160 IFS<1ORS>4THEN155
```

```
165 POKE36878,15
170 FORF=1TOV
175 FORD=15TO0STEP-DR:POKE36878,D:NEXT:POKE36873+S,0:POKE36878,15
180 POKE36873+S,O(F):PRINT"■":POKE36879,O(F)
190 NEXTF
195 FORD=15TO0STEP-DR:POKE36878,D:NEXT:POKE36873+S,0:POKE36878,15
200 POKE36879,8
205 PRINT"■■■■■■■WHAT NEXT:-"
210 PRINT"1-PLAY TUNE?"
215 PRINT"2-RETURN TO KEY BOARD?"
220 GETT$:IFT$=""THEN220
225 IFT$="1"THENGOTO145
230 IFT$="2"THENGOTO0
```

Errorline

THIS 64 utility comes from Alfred Eggli of Bettlach, Switzerland

ERRORLINE is a small but useful utility which will aid you when typing in complex listings. When you type in a listing you're almost bound to make a mistake, with the result that the computer comes up with "Error in line XXX" when you run the program. To correct the error, you must then list the line manually. Errorline lets you do this automatically, so that when you run a program any lines with mistakes will be listed for correction.

The program resides in memory at location $C000. It's automatically activated, and you should save it before first using it.

```
55000 rem   errorline-lister
55001 rem   ----------------
55002
55003
55004 rem   (c) a. eggli 1985
55005
55100 for i=49152 to 49238
55110   read a : z=z+a
55120   pokei,a
55130 next
55140
55150 if z<>8861 thenprint"error in data !!" : end
55160 sys49152
55170 print"errorline-lister activated !"
55180 new
55190
55200 data169,013,141,000,003,133,002
55210 data169,192,141,001,003,096,138
55220 data048,002,016,007,164,002,048
55230 data045,076,116,164,072,165,157
55240 data016,006,076,058,164,076,116
55250 data164,164,057,132,020,164,058
55260 data132,021,032,019,166,160,128
55270 data132,002,169,147,032,210,255
55280 data169,013,032,210,255,032,210
55290 data255,076,189,166,160,000,132
55300 data002,162,000,160,000,024,032
55310 data240,255,104,170,076,058,164
55320 data076,116,164
```

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Vic 20 in depth

I HAVE A Vic 20 with a Vixen 16K switchable RAMpack. I would like to master machine code graphics, joystick controls and other such things. Could you recommend a suitable book which is easily understood and well explained? I would also like to be able to move a character around the screen pixel by pixel rather than square by square, and to be able to colour in different pixels of a charcter using multicolour mode.
A Bushell
Uppingham
Leicestershire
A SUITABLE book for you would be Programming the Vic by RC West, available from Biblios, Star Road, Partridge Green, Horsham, Sussex, at £10.90. The following short multicolour demo comes from the book; 10 S = PEEK (646): POKE 646, 10: FOR B = 1 TO 15: FOR A = 65 TO 90: PRINT CHR$ (A);: NEXT: NEXT 20 FOR A = 1 TO 10: FOR J = 0 TO 15: POKE 36878, J * 16: NEXT: NEXT: POKE 646,S

Back to page zero

IN SEVERAL programs I've seen the use of a get key pressed from zero page location (197). In the Commodore reference guide it specifies that location to be; Current key pressed; CHR$ (N); 0 = No Key. I found that it does not accept CHR$ or ASC codes, but it has its own coding which does not seem to follow any of the tables in the guide. Could you tell me if this is a mistake in the reference guide?
BM Anderson
Hackney
London
197 ($C5) contains the matrix value of the key pressed during the last keyboard scan. A value of 64 ($40) means no key pressed. When a key is pressed a number from 0 to 63 is stored in 203 ($CB) and this is compared with 197 to prevent a key repeating if still pressed. The values stored are not ASCII codes, but are converted by the 64's ROM routines, particularly the ones at $EAE0 which determines the key ASCII value. Use PEEK to decode the key values. For example; 10 X = PEEK (203): IF X = 64 THEN 10: REM this prevents a long line of 64's 20 PRINT X: GOTO 10

You can test your reaction time with this one, because if you hold the key for more than a fraction of a second the number of the key will be printed several times.

Joystick one-liner

IS THERE a simple one line input, such as X = RJOY (0), which will enable a program to read joystick positions? I need such an input for ON and IF . . . THEN statements when simulating the changing perspective of a rectangle as seen by the pilot of a helicopter. I find the Commodore books and software very difficult to untangle; books on 64 Basic hardly mention the joystick.
L F E Coombs
Mill Hill
London
TRY THIS one;

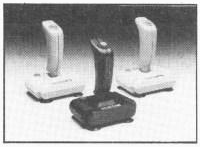
Q = PEEK (56320): P = ((Q AND 4) = 0) − ((Q AND 8) = 0) + 40 * ((Q AND 1) = 0) − 40 * ((Q AND 2) = 0): PRINT P

56320 is joystick 2 and 56321 is joystick 1. I had to squash this one to get it all on one line! You would use it in a subroutine, with the PRINTP not in the line but actioned on RETURN together with a loop. I don't think that a one-liner is best for the program you have in mind; a fast machine code routine perhaps called from Basic is needed.

The code can be stored as data statements in the program, and then READ and POKEd into memory.

Wiring the stick

I HAVE RECENTLY bought a C16 joystick and a 9-pin D plug to use on my CBM 64.



The problem is, I can't find out what coloured wires go where, since the 9-pin D plug has nine coloured wires and the C16 has only 7 colours. Can you help?
Matthew Andrew
East Ham
London
LOOKING at the 64's joystick port, pins 1-5 are on top and pins 6-9 are underneath, in order left to right.

Joysticks use pin 1 (up), pin 2 down, pin 3, (left), pin 4 (right), pin 6 (fire), and pin 8 (ground). Please be careful with pin 7, which carries five volts. Connecting this to the wrong input could cause damage to your computer. As you can see, only six of the nine pins on the D plug need to be connected.

The end of a file

I AM TRYING to write a Home Accounts program using a 1541 disk drive and a CBM64. I am using relative files, but have encountered a problem. In the program I need to detect the end of a file, and in the manual it states that this can be done by looking for Error 50.

I have tried this, but to no avail — all the disk drive tries to do is to input more data. I have two disk drives, and both act exactly the same, so it can't be a hardware fault. Here's a sample of my program;

```
100 OPEN 2, 8, 2MO$
110 OPEN 15, 8, 15
120 PRINT#15, "P" CHR$ (2+96) CHR$ (LO) CHR$ (HI) CHR$ (1)
130 INPUT #15, A, B$, C, D
140 IFA = 50 THEN GOTO "END OF FILE ROUTINE"
150 IFA < 20 THEN LO = LO + 1: GOTO 120
160 PRINT"ERROR"; A; B$; C; D: STOP
```

A M Jeffries
Billericay
Essex
THE COMMAND channel 15 should always be opened first and closed last. Line 120 in your program should read 120 PRINT#15, "P" CHR$ (2) CHR$ (LO) CHR$ (HI) CHR$ (1)

Error 50 is "Record not present", which is obtained by the disk reading past the last record either by INPUT# or GET#, or positioning to a record beyond the end of a relative file.

After detecting this error in your trapping routine, you must then reposition as in line 120 to a valid record, before attempting another record read. You ignore Error 50 only if you want to expand the file (with a PRINT# commmand).

Filling the gap

I WOULD be interested to know if you can recommend any software or programs suitable for the Commodore 64 on Dental Practices, accounts, and so on. At present I use Superbase 64 for accounts.
T E Callaghan
South Mall
Cork
FOR SMALL business accounts, you should try Micro-Simplex (from 8 Charlotte St West, Macclesfield, Cheshire).

If you are interested in doing your own programming, I suggest *Business Applications for the Commodore 64* by James Hall, published by Sunshine at £5.95. It contains some fairly easily adaptable subroutines and complete programs for business users.

"dialog..."

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Profile

First past the post

***Christina Erskine** talks to Sara Galbraith, whose First Publishing Company intends to be number one in Commodore 64 utilities*

AT JUST 26 years old, Sara Galbraith has packed a lot into her working life — she's been a cook, a secretary, marketing assistant, and brand manager in various companies. Her experience has culminated in First Publishing, her own business dealing with integrated books and serious software.

Serious, business-style software for the Commodore 64 took a back seat last year, with the wave of quality games being imported under licence from the States.

Yet last September, when US Gold and the like were just getting into their stride, Sara had just registered First Publishing, and was preparing to introduce easy-to-use word processors and spreadsheets, languages and assemblers. While First is not releasing anything completely new or innovative, Sara is confident that her approach to the market is the right one.

"My main objective is to establish a reputation for quality and reliability. To build up any sort of brand reputation, First Publishing's products must be instantly recognisable, which is why we've gone for the distinctive blue and yellow packaging on both the books and the software. I want, if you like, to become the Marks and Spencer of software — a brand people can choose because they know it'll be reliable."

Specifically, the software so far comprises FirstWORD 64 — "a very straightforward word processor — it must be about the only one you can load up and use immediately without having to wade through a manual," says Sara — a database entitles First BASE 64, which she claims is "every bit as good as Superbase," (Precision Software's flagship product), PowerPLAN, a spreadsheet, Pascal, and an assembler/monitor. Prices range from £19.99 to £44.99.

Venture

The books are designed to facilitate a deeper understanding of the Commodore 64, and are definitely not for the beginner. "That's deliberate," said Sara. "I felt that there were quite enough beginners' books on the market and it was time to do something for people who were ready for the next stage."

All this is a far cry from her first job as a restaurant cook. "I was perfectly happy being a cook," she grinned. "But I gradually realised that I wasn't going to get very far if I carried on drinking so much!"

"So I left cookery — and I hardly get the time to do any now, which is a shame — and became a secretary and worked my way up from there. I wouldn't say it was an ambition to run my own business though, I mean, two years ago, I would have found what I'm doing now unthinkable."

Her venture with First Publishing has been considerably helped by the support received from the German company Data Becker. So far, all First's titles have been licensed from Data Becker and translated into English. As Becker provided Sara with the original finance to set up First Publishing, I wondered if she was going to rely on Becker's product permanently.

"Oh no, the two companies are entirely separate — there's nothing in the contract to say that we have to use Becker's work.

"So far, I've done so, simply because it *is* very good. But I would like to deal with freelance programmers in this country in the next year or so.

"I'm very concerned that the company should become fully stable and established — I intend to be around for a long time. As I do have steady access to a source of excellent product, I'll use it. In two years time, though, I may well branch out and do something radical."

But why did Sara start up on her own in the first place? She was brand manager at Precision Software at the time, and doing well.

"It was frustration, sheer frustration. I wanted to be able to implement my own ideas. I had previously been at Peachtree Software — a company full of very able, very experienced men, who had all the flexibility of an iron bar. I was briefed to help set up an educational software division, but frankly, just not enough money was put into it.

"Then I moved to Precision, where the product was excellent, but the marketing non-existent. It was very easy to see what could be done, marketing-wise, but impossible to get people to act on my ideas.

So First Publishing arose out of Sara's wish to be able to implement, unimpeded, her own ideas.

"I tried writing begging letters to ask for the start-up finance for a company, but that came to nothing. Then I met Becker in Germany and discovered our ideas were identical."

Data Becker also has links with three other companies, in France, Holland and the USA, maintaining much the same sort of relationship as with First. Data Becker product therefore tends to reflect the popular machines in the countries concerned, which explains why so far all First product has been exclusively for the Commodore 64, with its international success. However, that is set to change.

"We have plans to convert and rewrite for the Atari ST and the Amstrad," said Sara. "The Amstrad has done very well in Germany, as well as the UK, and we have high hopes of the ST range. One of the Data Becker people is in Hanover, and has been working very closely with Atari and knows quite a bit about the range prior to launch."

It's now nine months since First Publishing began. Sara now employs seven staff, including two full-time programmers and two sales people.

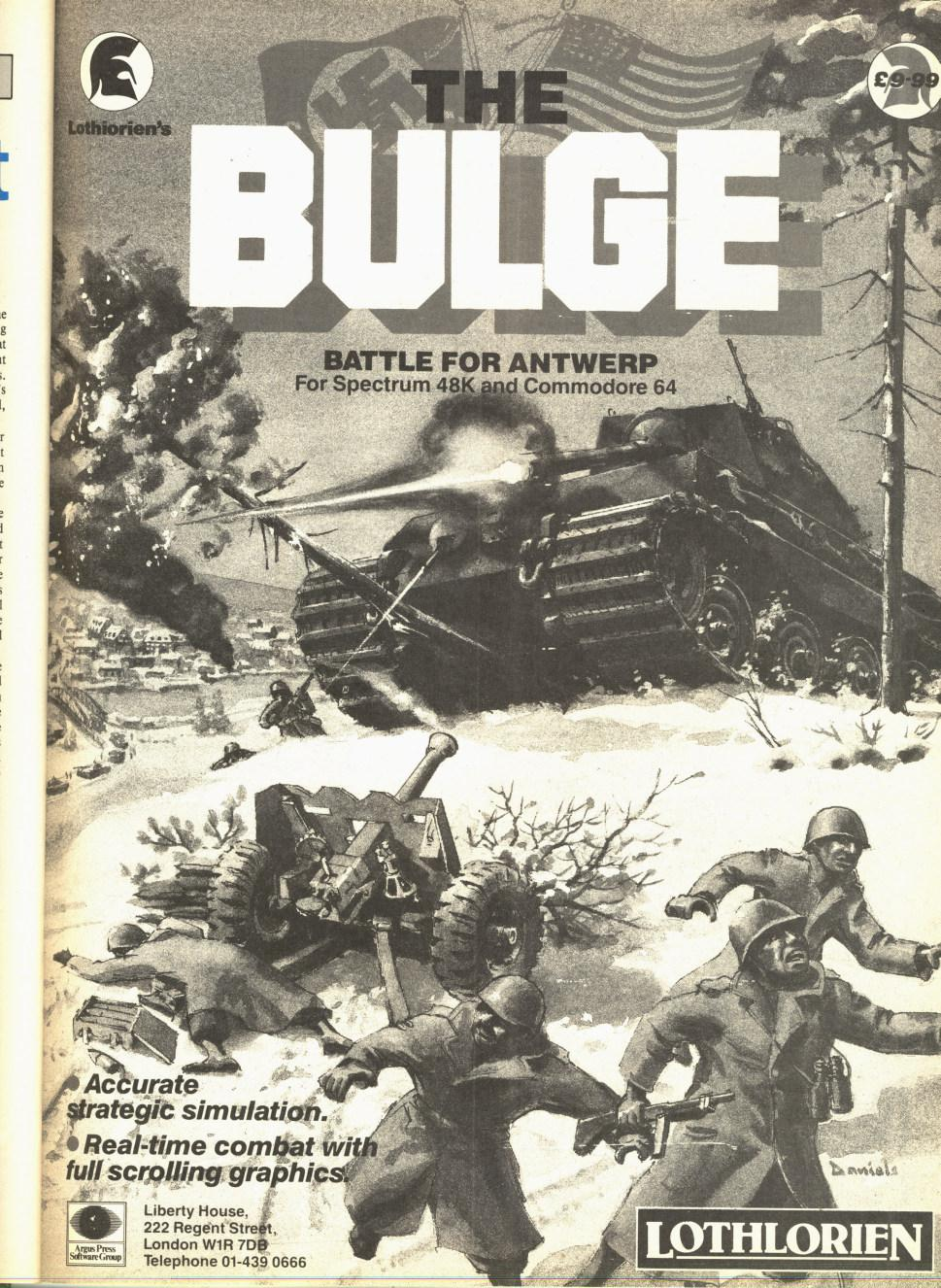
"I have the sales people on the road, talking directly to the dealers all the time. That way, the dealers get to know us as well. Some distribution does go through more conventional channels, but selling directly to the shops is often more effective.

Selling

"The company has already had its ups and downs though. We were three months late on the market with the first releases, which was very annoying. We had hoped to bring them out in October, but they didn't appear until just before Christmas, so we lost a lot of prime selling time.

"But sales have been good — surprisingly so, in fact. I feel that there is probably not a mass demand for our type of product yet, but I would certainly want to create one.

"What I'd really like at the moment is a partner who would share some of the responsibility. It really isn't at all easy doing it all on one's own."■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CBM 64 games to swop or sell. Games include Henry's House, Pit-Stop, Gyruss, Pacman, MS Pacman, Gorf, Soccer etc. Please ring 021 382 7991 ask for John after 5pm or write to John, 40 Dean Rd., Erdington, Birmingham B23 6QF.

CBM 64 fan, Mechanical Engineer, age 32, wishes to swap software and pen-pal. Please enclose list of disk programs with your letter, Tom Piotrowski, P.O. Box, 610 Dee Why, Sydney, NSW 2099, Australia.

CBM 64 software to swap, titles include Summer Games, R. O. Moscow, Tapper, Bruce Lee, Hunchback II, want Casy Jones, Up n Down, not all originals. For list write to P. Baker, 27 Burnham Road, Hullbridge, Essex. Tel: (0702) 232683.

COMMODORE 64, swap or sell Simon's Basic, Currah Speech, The Quill on disk, boxed Future Finance on disk any offers considered, many games to swap mostly disk. Ring 051 644 9488 after 6pm please "Wirral".

CBM 64 software to swap many titles including new releases. Send lists to Steve, 45 Wallgate Road, Childwall, Liverpool 25. Cassette only please. Tel: 051 722 7052 after 6.30pm.

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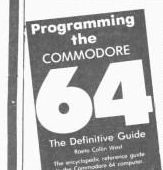

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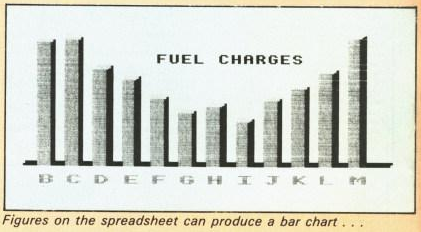

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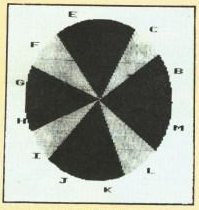
The Mini Office version is ideal for home finance, providing you with an effortless means of keeping tabs on your income and expenditure – and enabling you to work out your own budget.

In our Spreadsheet program – as well as in the Database – we have provided



. . . or a pie chart

a sample file so that you can experiment with it before entering your own data.

One feature we have included which to our knowledge does not exist in any other spreadsheet is a warning device to prevent you accidentally erasing formula – a very useful precaution.

The **Graphics** program uses the standard business graphics – line, bar and pie charts – in full colour. Which is something not always available on far more expensive graphics packages.

The program uses data you have already prepared on the spreadsheet. You have to identify which set of information you require to see in graph form – such as by indicating which row or column – and then which of the graphs you require.

The graph is then automatically configured exactly as you require it. If you have suitable printer capable of producing graphics you can also print out hard copies for a permanent record.

Because our original intention was to produce a package for people new to all these applications, we have produced a fully-detailed, easy to understand manual.

This 32 page free booklet gives clear instructions about how to use all four programs and in itself forms a concise introduction for first-time users.

If you want to start doing more with your micro than just playing games, this package is your ideal introduction to the four most popular applications for professional computers.

● *Graphics illustrated here are from the Amstrad version and are slightly different on the Commodore version.*

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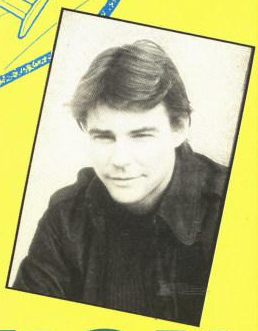


COMPETITION

ELITE's arcade action game for the 64 captures all the excitement of the TV series Airwolf. Now you can win Airwolf games, watches and posters in our exclusive, easy-to-enter contest!

THE EXPLOSIVE ITV action series Airwolf returns later this year — but Commodore 64 owners can share the excitement now with Elite's thrill-a-minute game.

Airwolf is a state-of-the-art assault helicopter, equipped with an arsenal of weapons and high technology stealth capabilities.

Airwolf's pilot is the daring Stringfellow Hawke, former Vietnam chopper pilot, and the only man trained to handle the multi-million dollar helicopter.

In Elite's game, you must pilot Airwolf through a maze of underground caverns, attempting to penetrate the deadly defences of General Zaranov. He is holding captive a team of brilliant scientists, and you must overcome his defences with a combination of logical thinking and quick reactions in order to rescue them.

You can win a copy of Airwolf for the 64, plus other great prizes, in our easy-to-enter contest.

- TEN first prize winners will get copies of Airwolf from Elite, plus Airwolf digital watches, retailing for £12.95, plus giant 5x3 foot Airwolf posters.
- TEN runners-up will get the game and the poster, all courtesy of Elite Software.

Just answer these questions:

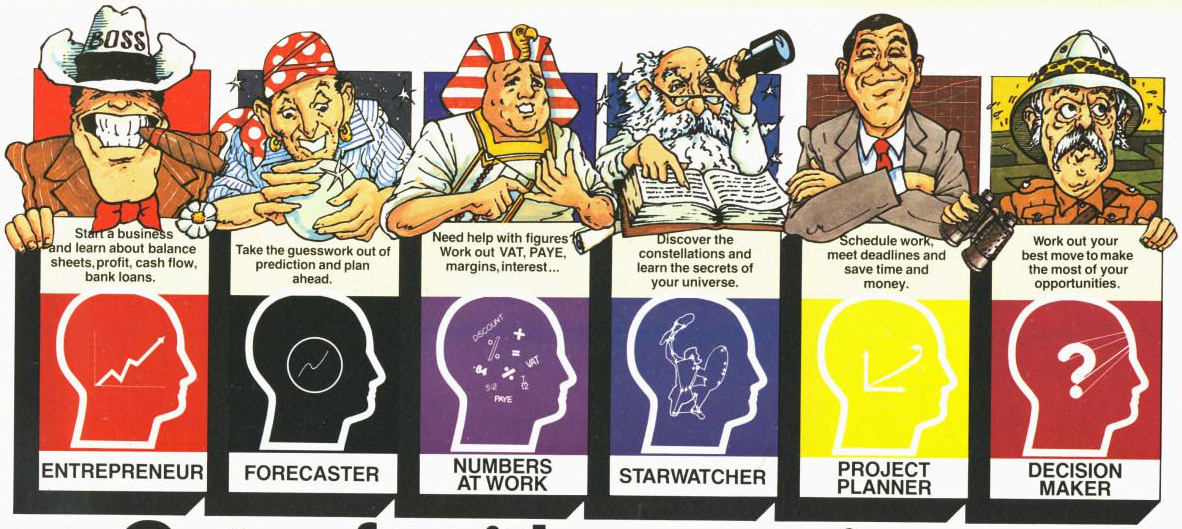
- WHAT was the name of the helicopter featured in a recent film starring Roy Scheider?
- WHICH type of helicopter did James Bond fly in the film You Only Live Twice?
- WHAT popular TV series set in Korea featured helicopters serving a hospital?

Put your answers on a POSTCARD and complete this tie-breaker: "I want to fly with Airwolf because . . ." in an apt and amusing manner in fifteen words or fewer. Then post your entry to Airwolf Contest, Commodore Horizons, 12/13 Little Newport Street, London WC2H 7PP, to arrive by the last day of June. Normal competition rules apply, and winners will be announced in the August issue.

THE WINNERS of the April Hobbit competition have now been selected. Each of the fifty winners, who had to study the wordsquare and spot the odd word out, will receive a copy of the Disk Hobbit from Melbourne House.

Ten lucky winners will get a DK'Tronics/Currah Speech 64 voice synthesiser, having written the best captions for our April contest. The winners are: D Batten, London; S McCarthy, Newark; T Whitehead, Tadworth; C Nicholls, Stanley; P Welch, Lower Brailes; L Russell, London; A Brown, Ammanford; T McKee, Dingwall; P Lawler, Coxford; S Lai, London.

elite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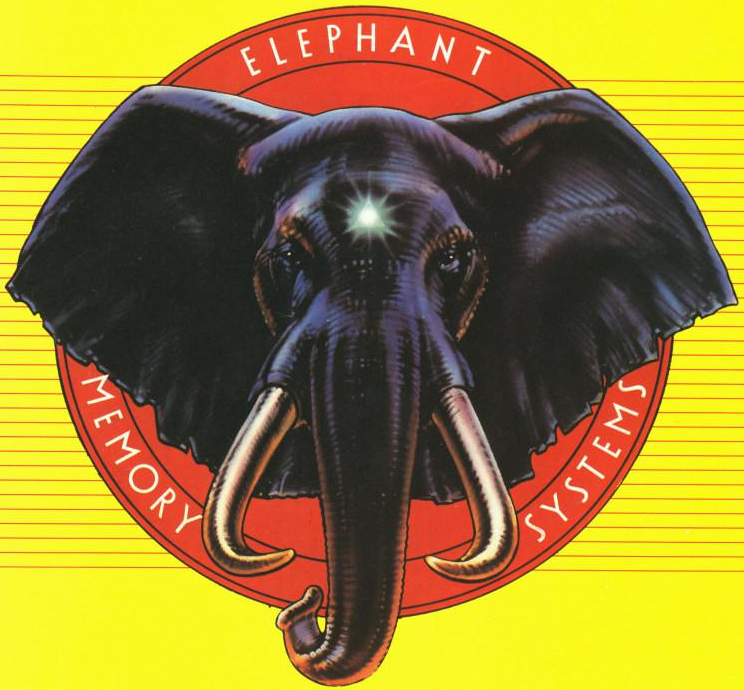

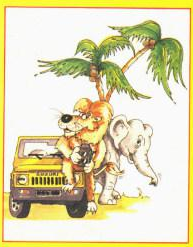

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